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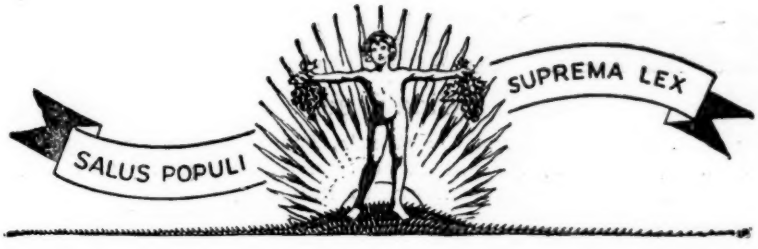

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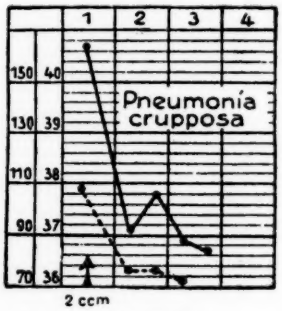
HALVING THE DEATH RATE IN PNEUMONIA

SOLVOCHIN „HOMBURG"

Indicationes: Pneumonia crupposa*)

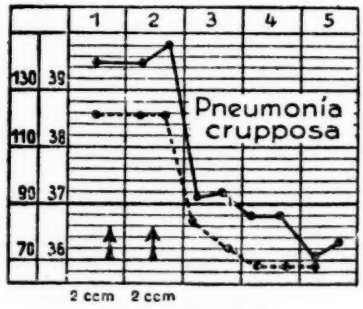


Febris finitur.

2 ccm: 0,5 g Chinin.

Pro dosi et pro die: 2 ccm

Scatulae originales:
Amp. III et XII à 2,2 ccm



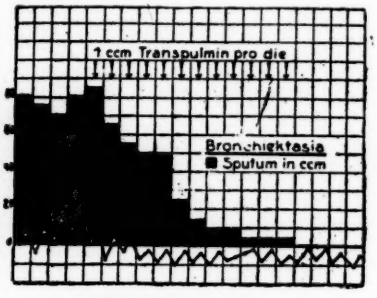
Morbus minuitur.

*) Praeterea: ad accelerandum partum et abortum; ad curandam malariam.

TRANSPULMIN „HOMBURG"

Indicationes:

Bronchitis acut. et chron., Bronchitis putrida, Bronchoblenorrhoea, Bronchiektasia, Bronchopneumonia, Pneumonia postoperat., Abscessus pulmonum, Gangraena pulmonum, Influenza, etc.

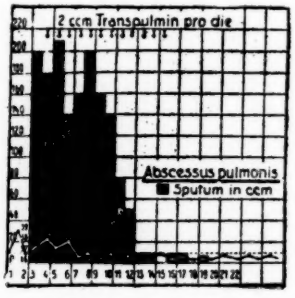


Deminutio sputi.

1 ccm { 0,03 g Chinin. bas. anhydric. / 0,025 g Camphora in ol. aetheros. solut.

Dosis: pro die 1—3 ccm

Lag. orig. à 10 et 25 ccm
Scatulae originales:
Amp. VI et XII à 1,1 ccm
Amp. V et X à 2,2 ccm



Deminutio sputi.

See "MEDICAL WORLD," August 24th, 1928:

"An analysis of the cases reported by these writers, in addition to those published by Aufrecht, as well as the cases treated by us, shows a mortality of 20 per cent. in over 2,200 cases of pneumonia in which quinine was not administered, whereas it amounted to only 9.6 per cent. in approximately 1,000 cases in which injections of quinine were given either in the early or late stages of the infection."

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A British Medical Association Lecture

ON THE

UNDERLYING DISTURBANCES OF METABOLISM OF THE NERVOUS CHILD.

DELIVERED BEFORE THE WEST SUFFOLK DIVISION

BY

HECTOR CHARLES CAMERON, M.D., F.R.C.P.,

PHYSICIAN IN CHARGE OF THE DEPARTMENT FOR DISEASES OF CHILDREN, GUY'S HOSPITAL.

THE metabolic processes of all children, just because they are children, are less stable than they become in later life. It is in this instability that we find the explanation of the greater frequency in childhood of many disorders due to biochemical derangement—as, for example, eczema, tetany, convulsions, urticaria, or asthma. The peculiar liability of the nervous child to these derangements of metabolism, especially to that common condition known as acidosis, is not only a direct result of his undue sensitiveness to emotional excitement or to physical fatigue, but the state of disordered metabolism so produced is of itself provocative of that restlessness, irritability, or nervousness for which our advice is sought. The nervous child is prone to acidosis, but whenever the symptoms of acidosis are recognizable there is apt to be a simultaneous exacerbation of all the symptoms of nervousness.

The Liability of the Nervous Child to Cyclical Disturbances.

We may look on the nervous child from one point of view as a problem in management, quick to respond to all influences for good, but quick also to react violently even to small mistakes in our management of him. Or, again, we may lay stress upon the physical defects which are so often characteristic of him—the faulty posture, the lax and toneless muscles, the drooping, sagging stance, and the neuro-muscular inco-ordination—all of which are the outward and visible signs of the tired, restless, and irritable brain. But from another point of view we must attempt to probe even more deeply into the problem. We must seek to determine the nature of these recurring waves of disturbed metabolism, which account for the peculiar instability both of physical health and of conduct characteristic of the nervous child, and which are manifested in the "bouts" or "attacks" or "turns" of which, in one form or another, complaint is almost always made. The symptoms which together make up the well-recognized and familiar attack are not the same in different children—in one vomiting, in another nervous diarrhoea; in one drowsiness and prostration, in another restlessness and irritability.

What is the underlying cause of this recurring state of collapse, physical and mental, so characteristic of the nervous child? Why does he so often suddenly fall from a state of comparative well-being to a deplorable condition of weakness, accompanied by loss of weight and loss of colour—with circumoral pallor and dark-rimmed eyes; loss of muscular tone and loss of co-ordination—so that at the worst his walk deteriorates to a mere shuffle and the frequency of his falls becomes a common complaint; loss of energy, so that he lags behind on his daily walks abroad, or, at their conclusion, throws himself down with many significant yawnings and sighings; loss of control, so that clamour, opposition, and tears may become unceasing; and loss of concentration, so that his work at school sensibly deteriorates? And with all these distressing backslidings there are often, almost usually, other complaints—rapid, excitable overaction of the heart, which sometimes leads to a diagnosis of dilatation of the heart; a continuous irregularity of the temperature which cannot but rouse fears of latent tuberculosis; transitory aches and pains in the lax and toneless muscles of the limbs after any exertion, apt to cause confusion with the subacute arthritis of rheumatic fever; and recurrent bouts of abdominal pain of short duration and always accompanied by a striking vasomotor pallor, which must arouse the fear of the presence of appendicitis. The tongue is almost always white, the breath, especially in the early morning, is apt to be charged with the faint odour of acetone, while sleep, always disturbed and restless, is often broken by night terrors or sleep-walking. It may be that vomiting is by far the most prominent feature of the attack, as in the classical picture of so-called cyclical vomiting. More often vomiting is only occasional, or it may be altogether absent. Sometimes nausea and dizziness may be complained of, especially in the early morning; sometimes there may be no complaints of gastric symptoms at all. Lastly, it is when the child falls into this state of pallor and prostration that all nervous symptoms tend to undergo an exacerbation. It will often be found that, coincidently with the state described above, the particular disturbance to which any child is prone—masturbation, enuresis, tics and habitual movements of all sorts, squintings, stammerings, and the rest—spring to life again, and proceed with renewed force.

Glycopenia.

Our food is the source of the energy expended in all the activities of life, physical and mental. Our food contains fat, carbohydrate, and protein in suitable proportions. In general it may be said that comparatively little of the protein is utilized as fuel. The protein is too valuable to be employed merely to provide energy for the machine, and is used mainly for structural repair and replacement. The carbohydrate may be said to be the petrol of choice, that on which our machine is run in the first instance. But we have only a meagre store of carbohydrate in our bodies. In an adult male perhaps about 8 ounces may be stored away in the form of glycogen in the liver and in the muscles. These slender reserves of carbohydrate are readily exhausted, especially by physical exertion, by emotional excitement, and by pyrexia. When so exhausted we may, perhaps, speak of a state of glycopenia. The actual percentage of sugar in the blood varies within well-defined limits. After a meal of starch or sugar the blood sugar rises rapidly to 0.18 per cent., to fall within a few hours to the fasting level of 0.07 per cent. We speak, therefore, of a blood sugar curve. Without the frequent administration of carbohydrate the blood sugar remains constantly at the fasting level. Certain diseased states are characterized by a definite hypoglycaemia, a definitely low blood sugar. In Addison's disease, for example, in which the suprarenal glands are destroyed by caseation, there is often hypoglycaemia accompanied by great vasomotor weakness and pallor, a low blood pressure, a rapid pulse, extreme amyotonia and muscular weakness, prostration and loss of energy, and attacks of nausea and vomiting.

We know that the suprarenal glands are exhausted and that their function becomes impaired under the stress of great exertion, of great emotional excitement, or of persistent infection. These are the same conditions which lead to the exhaustion of the carbohydrate reserves and the fall of the blood sugar to the lowest level, and they are the same conditions which in practice we are forced to regard as productive of the "bouts" or "attacks" of pallor, prostration, and vomiting of the nervous child. If speculation is permitted where certainty is not yet, we may surmise that in Addison's disease we are observing the effects of the gross destruction of the suprarenal tissue; in an attack of cyclical vomiting we are encountering the temporary exhaustion and functional impairment of the same gland. The failure to mobilize by means of the suprarenal glands sufficient carbohydrate to achieve the complete metabolism of the absorbed fat is in all probability the explanation of all these "bouts" or "turns," so variable in their individual symptoms. That in most cases the mobilization of the necessary carbohydrate is in the end successfully achieved spontaneously and somewhat suddenly, after an interval in which the child may suffer extreme distress, is in keeping with the hypothesis that the suprarenals have become temporarily exhausted. In many cases of severe cyclical vomiting, without any treatment at all,

the symptoms, which, up to a point, have been progressive and threatening, suddenly subside. There has been delay in the necessary mechanism for carbohydrate mobilization.

Ketonaemia.

Without sufficient carbohydrate the metabolism of fat is unable to proceed smoothly. Fat is, as it were, the reserve fuel, of which, unlike carbohydrate, there is plentiful storage. But fat can only serve as a satisfactory fuel, can only be metabolized completely, in the presence of a sufficient amount of carbohydrate. Without sufficient carbohydrate the process of reduction to oxygen and water is not completed, but certain intermediate products of combustion, the so-called ketone bodies, accumulate in the blood and are excreted for the most part by the lungs, but also, especially when present in great amounts, in the urine. The condition, commonly called acidosis, is therefore more strictly a ketosis, because although ketosis is a form of acidosis, yet it is only one of many varieties of acidosis.

The presence of ketone bodies in the blood produces further chemical reactions. When we speak of acidosis we do not by any means imply that the reaction of the blood has definitely moved to the acid side. We mean only that we are able to detect the shifts that the body is put to in its successful effort to prevent any significant alteration in the reaction of the blood. We recognize, in other words, that the reserves have been called into action. Only in states of great danger, in the presence of death itself, when these reserve mechanisms fail or become exhausted, is there an actual shift of the reaction of the blood to the acid side. The acid base balance is preserved by many and complicated devices, but that which plays perhaps the greatest part is the regulating power of the respiratory centre acting under the stimulus of the excess of carbonic acid in the blood. The acid ketone bodies combine with the sodium bicarbonate in the blood, setting free an equivalent amount of carbonic acid, which is then removed from the blood by the stimulation of the respiratory centre and the consequent increase of pulmonary ventilation. Hence in the condition known clinically as acidosis, besides a state of glycopenia with a blood sugar at a low fasting level, or even occasionally a definite hypoglycaemia, and besides a significant ketonaemia, there is found a diminution in the alkaline reserves of the blood, compensated for to some extent by an increased formation of ammonia.

In the need for increased pulmonary ventilation we have the explanation of the common complaint of the mother that the child is constantly yawning, sighing, or taking deep breaths. When the smouldering state of acidosis erupts into a definite bout of cyclical vomiting the onset is usually heralded in this way by much yawning and sighing. If we pursue this attempt to find some explanation of these common symptoms of physical and mental prostration we may perhaps attribute especially to the ketonaemia the extreme muscular relaxation, both of the skeletal muscles which shows in the flat-foot, the winged scapulae, and the lordosis with the too prominent abdomen, and of the vasomotor muscles which results in such striking pallor. The effect of the accumulation in the blood of these imperfectly oxidized fatty acids is in many ways comparable to the effect of chloroform anaesthesia, not only in derangement of the function of the liver, but equally strikingly in the profound muscular relaxation and vasomotor paresis. Through the toneless abdominal muscles of a child suffering severely from acidosis I have seen an intussusception reduced by manipulation with the greatest ease. Muscular relaxation more perfect for the purpose could not have been produced by profound chloroform anaesthesia. The muscular aches and pains, and the tendency to fall too readily, are secondary results of the amyotonia. It is, perhaps, not to be wondered at that the child with a persistent acidosis, with quick, rapid, and uncontrolled movements and toneless musculature, is more liable to suffer from greenstick fractures than are other children, not because the bones are softer or more brittle, but because the muscular support is poor and the child is incapable of making that sudden movement necessary to restore the balance, or at any rate to mitigate the severity of the fall. In "night terrors," in the comatose sleep of enuresis, and in the tendency to nausea and bilious vomiting we have further symptoms which bring to mind the similarity between the effects of chloroform and the effects of the ketone bodies in acidosis. The behaviour of a child struggling under light anaesthesia and of a child with night terrors are strikingly alike.

The Part Played by Infection.

Very often this state of prostration and of pallor is directly caused or greatly increased by some infection, and the removal of some persistent source of infection—as, for example, by tonsillectomy—becomes a necessary part of the treatment, not only of the state of acidosis but of the plentiful crop of nervous symptoms of one sort or another which thrive in this particular soil of acidosis. Infection is a potent and frequent cause of acidosis. Yet it is also true that acidosis, even in its mildest degree or in its incipient stages, powerfully predisposes to infection. The proneness of many of these pallid and lax children to trivial catarrhal infections adds greatly to the difficulties of their management, because, although the infection in itself may be of the slightest, the further disturbance of metabolism to which it gives rise is apt to be severe and persistent. In the total illness a trivial infective component may be altogether submerged in the metabolic component.

Acidosis and Asthma.

Nor is it enough to realize that acidosis predisposes to infection, and that infection produces a great exacerbation in the acidosis. An examination of a large number of children of this type will show many in whom it is clear that the disturbance of metabolism is itself capable of producing irritation and a catarrhal reaction in the mucous membranes lining both the bronchi and the bowel. In certain children mucous diarrhoea takes the place of vomiting as the most prominent symptom of the cyclical disturbance. In others, again, the main symptom is that of recurring attacks of bronchial asthma. We are reminded of a similar association in the so-called uraemic colitis and uraemic asthma. The part played by acidosis in the production of the asthma of childhood, or at least, if production is too strong a word, in the determination of the moment when an attack comes on, has not been sufficiently emphasized. A large number of children with asthma suffer at the same time from cyclical vomiting in greater or lesser degree. That there are other factors concerned in the production of the liability to asthma is clear, but it may well be that the danger point for an attack of asthma is reached, in the child so predisposed, when the blood sugar is at its lowest. Over-exertion, over-excitement, and infection are the main exciting causes in the cycle both of asthma and acetonaemic vomiting. In the part played by glycopenia we have, perhaps, the explanation of the tendency, common to both disorders, to nocturnal exacerbation. Asthma is apt to become worse at night; cyclical vomiting almost always begins at night. Such children stand even the physiological starvation of the night badly, and in the absence of a frequent intake of sugar the nocturnal metabolism is relatively unstable. The frequent combination of asthma with cyclical vomiting, or with some other manifestation of acidosis, is perhaps to be accounted for by the circumstance that both disorders occur almost entirely in excitable eager children who in action mobilize all their reserves of energy and suffer a corresponding exhaustion in reaction. In practice it is often found that successful control of the acidosis brings with it cessation of the asthmatic attacks, or at least a diminution of their number.

In the pale, exhausted, irritable, and nervous child suffering from, or about to suffer from, a "bout" or "attack," with or without vomiting, biochemical examination shows as a rule a blood sugar at a low level, if not a definite hypoglycaemia, ketonaemia, and a diminution of the alkaline reserves of the blood. In some children the attacks are very slight, in some very severe, but a study of the children and of their health from day to day and from month to month can leave no doubt of the essential identity of all the attacks, major and minor. In the same child not all the attacks culminate in vomiting. Many are, as it were, abortive. Nor do I think that there can be

any doubt as to the success of therapy based upon those biochemical findings—a reduction of the intake of fat to within the limits of the tolerance of the individual child, a freer intake of easily absorbed carbohydrate, and the provision of a daily depot of alkali.

Reduction of the Intake of Fat.

The reduction of the intake of fat need not, as a rule, be very drastic. There is, however, a natural tendency on the part of parents, made anxious by the extreme thinness of the child, to endeavour to improve matters by adding very considerably to the intake of fat. Cream or top milk and cod-liver oil are apt to be given freely, with the result that the trouble is increased and perpetuated. This is especially apt to occur when the fear of tuberculosis has been aroused. The propaganda in favour of a diet rich in fat receives support largely from observations upon the children of the poor, who, in general, are fed on much carbohydrate and little fat. The cost of sugar and starch per calorie is low, of fat high. Among the poor the ill effects upon this disorder of a diet too rich in fat are seldom apparent. Among the better-to-do they may be very evident. The omission of cream and cod-liver oil, the removal from a very rich milk of some part of the cream, the restriction of the intake of eggs and butter, perhaps to three eggs and a quarter of a pound of butter a week, may be necessary in households where the provision of milk, cream, butter, and eggs in large amounts has been considered the first essential for health and strength. Chocolate contains a high proportion of a fat which these children appear to tolerate especially badly, and should be omitted, as should all forms of sweets which are rich in fat. Radiostol or ostelin may perhaps usefully be prescribed to children whose intake of fat is restricted for the time being in this way. With improvement in weight and in colour the restrictions may be gradually removed. It is very evident that we have especially to consider the state of the child at the moment when the meal rich in fat is taken. When tired or pale, after exertion or excitement, or in convalescence from infection—when, as we may imagine, there is a state of glycopenia—fat metabolism may be especially unstable. One observant schoolgirl, having fallen prey to one of her attacks of sickness, wrote home to her mother that it was not the rehearsal for the school play which was responsible for her sad state, nor was it the dripping of which she had partaken freely, "it was eating the dripping after the play."

The Provision of Carbohydrate.

For children in the state described the provision of a free intake of easily assimilated carbohydrate is very necessary. Moreover, experience shows that if the nervous child is apt at times and in certain states to have a low tolerance for fat, there is, as a rule, a high tolerance as well as a high need for carbohydrate. Only by constant replenishment of the carbohydrate reserves can we prevent that wasteful and imperfect oxidation of the meagre store of body fat which manifests itself in the bout of acidosis with the sudden and extreme loss of weight. The digestion of carbohydrate is usually well accomplished. If we encounter difficulties they are concerned usually not with digestion, but with the dislike for sweet things. The natural desire for sugar, which is part of healthy childhood, is apt to be absent in these infant intellectuals, who may prefer the savoury to the sweet. On the other hand, many constantly make demands for sugar, demands which some parents, influenced by the propaganda against sugar, sternly repress.

Propaganda on health matters is apt to suffer from the disadvantage that in the process of the simplification necessary for popular understanding most of the truth is apt to disappear. A diagrammatic presentment without light and shade, and with no place for the exceptions to the general rule, is all that can be attempted. The child with an inborn tendency to acidosis is, in this respect, the exception, and an indiscriminate propaganda in favour of a diet with much milk and cream, and with little or no sugar, has worked steadily against him.

Meat, fish, green vegetables, and fruit may be given as usual. On one side we must supervise, and may have to restrict the intake of fat. On the other side we must raise proportionately the intake of sugars and starches. All cereal foods, wholemeal bread, rusks, oatcake, wheatmeal biscuits, sugar, jams, jelly, honey, and golden syrup may be given more freely than usual. Suet pudding consists of so much flour and so little suet that it is permissible. A reasonable amount of barley sugar, maple sugar, sugar candy, or boiled sweets may be given daily at meal-times.

The prescription of glucose in the form of a drink flavoured with fruit juice has been of real service. Glucose has several advantages over cane sugar as a means of replenishing the carbohydrate reserves. It is only about one-half as sweet as cane sugar; it is absorbed very rapidly into the blood stream from the upper alimentary tract, and has not the same tendency to cause a fermentative diarrhoea. Its use, too, seems less likely to be followed by the appearance of urticaria, a troublesome result in some children of the free administration of cane sugar. Given between meals it does not disturb appetite, and has something of the effect of a glass of wine in the resulting improvement in colour and sense of well-being.

In insulin hypoglycaemia, mental states of excitement, apprehension, and confusion, as well as muscular weakness, are controlled with astonishing rapidity by means of a few lumps of sugar. In these nervous children something of the same sort can be achieved, if less strikingly and in less degree.

The daily prescription of a small dose of alkali is often helpful. It is common to advise the intake daily of a teaspoonful of sodium bicarbonate. If, as is often the case, there is constipation, to the morning dose of glucose there may be added a little Vichy water or other laxative saline.

By dietetic regulation along these lines, and by the free administration of glucose and of a small amount of alkali, good results can sometimes be achieved. Often a very rapid increase in weight, and improvement in colour and energy, follow the subsidence of the state of acidosis. Sometimes the whole character of the child seems to alter for the better, so that ceaseless opposition and resistance, or timidity, or tearfulness disappear. There may be unmistakable improvement in such symptoms as night terrors, asthma, enuresis, train sickness, even stammering, as the general health improves and self-confidence returns. Almost always the more direct symptoms of the acidosis, the tendency to bouts or attacks of vomiting or diarrhoea, or pyrexia, are manifestly controlled. When no such fortunate result occurs, but the symptoms continue unabated, the explanation lies sometimes in the presence of some focal infection, and sometimes in a persistent failure of the management. Encouragement, rest, freedom from infection, and a high intake of sugar—these seem the special needs of the nervous child.

DIAGNOSIS OF CANCER OF THE COLON.

BY

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CANCER occurs more commonly in the colon than in any other part of the alimentary tract, with the exception of the stomach. Colonic cancer is, however, of the less virulent type—that is to say, its rate of growth is comparatively slow, invasion of the lymphatic vessels and glands is relatively late, while remote secondary deposits, such as liver metastases, are, save in advanced and exceptional cases, distinctly rare. *A priori*, therefore, we have here a favourable field for surgical intervention, a fact which carries with it a correspondingly serious responsibility. If we are to meet this responsibility fairly all our resources must be thrown into the effort to detect the cancerous lesion at the earliest moment.

THE DEVELOPMENT OF COLONIC CANCER.

It will perhaps make for clearness of description if we regard cancer of the large intestine as exhibiting, from the clinico-pathological aspect, three distinct phases.

1. *The Pre-cancerous Stage.*

In this stage a lesion is present which is capable of developing, and, if untreated, does ultimately develop, into a cancer. Recent work has shown conclusively that a very strong potentiality for malignant change is inherent in the simple intestinal adenoma. Cancer of the colon is invariably an adeno-carcinoma; its mode of origin in a selected area of bowel is described by Dukes as follows: first, the occurrence of small localized areas of epithelial hyperplasia from which arises a crop of adenomata; next, the formation of an adeno-carcinoma from one of these areas or in the neighbouring epithelium; finally, when the definite transition to carcinoma has been effected in one of these little tumours, a tendency to undergo retrogression in the others, which are, consequently, not prominent in the stage of developed cancer. The best instance of this change is seen in those rather rare cases of multiple adenomata (adenomatosis) which show a marked tendency to malignant transformation. Saint, in a study of the intestinal polypi, found that, in the large bowel, the sigmoid was by far the most frequent site of occurrence, and that the adenoma was by far the most common type of polypus encountered. If we compare Saint's figures with those of others showing the relative incidence of carcinoma in various parts of the colon, we find a remarkable correspondence. Saint's figures are: caecum 8, ascending colon 6, transverse colon 3, descending colon 5, sigmoid colon 20. Thus nearly 50 per cent. occur at the sigmoid. Burgess's figures give 55.3 per cent. and Brown's figures give 53.1 per cent. as the proportion of sigmoid cancers in the large bowel. We cannot help feeling that we may have here an explanation of why cancer occurs so much more frequently in the sigmoid than in any other part of the colon. Unfortunately, in the present state of our knowledge the clinical value of these facts is not very great. Apart from the rectum and lower sigmoid, adenomata have been recognized clinically only under two conditions. (*a*) In adenomatosis symptoms occur which are distinguishable from those of ulcerative colitis only by the use of the sigmoidoscope. It is useful to remember that this may be the real pathology underlying cases of ulcerative colitis. (*b*) The single polyp, unless it has undergone ulceration or has attained a considerable size, may first be revealed through the occurrence of an intussusception.

Recently a young woman was admitted to my wards with an intussusception involving the whole sigmoid, the starting point of which was a polypoid adenoma. A more striking case was that of a man, aged 69, who consulted me for recurrence of a rectal polypus which had been removed by another surgeon two years previously. I removed the growth, together with a portion of the bowel wall. The pathological report on the specimen was as follows: "The tumour is a papillary adenoma. The only sign of malignancy consists of mitoses; but as these are present in numbers the condition appears to be one of very early malignancy." This patient comes regularly for proctoscopic examination, so that should the cancer unfortunately continue to develop it will at least be recognized at a very early stage.

The more frequent use of the sigmoidoscope, especially in elderly patients, should, by revealing these adenomata so common in the sigmoid, enable us to lower considerably the incidence of colonic cancer.

2. *The Latent Stage.*

In this stage cancer is definitely present, but betrays either no sign of its existence or signs so vague and inconspicuous as not to attract the attention even of the patient. The pathological condition present in the silent period is either a cauliflower growth which has not yet begun to bleed or to ulcerate, or a constricting growth, the effects of which are being adequately compensated. This silent phase is, of course, an unfortunate characteristic of the early growing stage of internal cancer in any part of the body, but it is particularly unfortunate here in view of the relatively good prognosis which attends competent surgery in clinically recognizable cases. It is truly remarkable to what extent non-obstructing cancers of the colon can grow without producing definite symptoms, and it is not uncommon for the accidental discovery of a lump by the patient or by his medical attendant to be the first sign of disease. It is at this stage that the development of anaemia, which is an almost constant feature of cancer of the proximal colon, whether it occurs in youth or in adult life, is of special significance. Flint records the case of a woman who consulted her doctor on account of shortness of breath, when routine examination revealed a lump in her abdomen, which was subsequently proved to be a cancer of the proximal colon. She had suffered neither pain nor irregular action of the bowels, but was extremely anaemic. A precisely similar case occurred in my own practice. An analogous form of secondary anaemia is found also in cancer of the stomach. This common tendency to anaemia in gastric and caecal cancer gives an added significance to the anatomical description of the caecum as a "second stomach."

3. *The Stage of Observable Clinical Manifestations.*

At the outset it is necessary to realize that cancer of the colon takes two main forms with correspondingly distinctive effects. In one these effects are due to the presence in the lumen of the bowel of an ulcerating mass; in the other to the progressive narrowing of the lumen by a constricting process. This distinction is, of course, not always sharply defined, since an ulcerating growth may cause obstruction and a constricting growth may, and often does, exhibit some degree of ulceration. The broad difference nevertheless remains, and it is of the utmost importance that it should be borne in mind.

What are the effects of ulceration? If we visualize, for a moment, the presence of an ulcerating growth in the bowel wall it is clear that not only is the growth itself an irritant which the bowel seeks to expel, but that, as a direct consequence of its presence, new and deleterious elements are added to the intestinal contents. These are: (*a*) Excess of mucus from the cells of the tumour and from the irritated mucous membrane, a feature of which sometimes leads to the erroneous diagnosis of mucous colitis. According to Ochsenhirt mucus production in large intestine cancer is an indication of differentiation on the part of the growth, and he seeks to establish the postulate that the number of mucus-secreting cells in the carcinoma is inversely proportional to the grade of malignancy. (*b*) Small quantities of blood, due to traumatism of the ulcer face. (*c*) Septic material from the surface of the ulcer, which in such an environment cannot long remain free from secondary infection.

The combined result of the presence of an irritating growth and the local accumulation of irritant material is to cause an increase in the functional activity of the bowel —that is, increased frequency of peristalsis resulting in diarrhoea, which is mainly of the mucous type. Brown found diarrhoea in 36 per cent. of his proximal and distal colon groups, but, whereas in the former it was a true diarrhoea, in the latter it was rather tenesmus, attacks of which alternated with periods of obstinate constipation.

When colonic irritability of this kind sets in and persists in a person who has previously led a regular bowel life, the suspicion of cancer must be strongly aroused. This is especially true in very old people, in whom chronic diarrhoea is very frequently due to cancer. I would here advise caution against the dangerous diagnosis of colitis, which I have seen followed—as who has not?—after a regrettably long interval, by a palliative colostomy. Petrén records a case of a patient who, after treatment of three years' duration for ulcerative colitis, was found to have cancer of the splenic flexure.

There are other less direct but equally characteristic effects of the ulcerative process, and of these the most important is anaemia, which is especially characteristic of cancer in the proximal colon. So characteristic is it that the development of a severe secondary anaemia for which there is no obvious cause should direct attention towards the possibility of caecal cancer. There are two curious facts about this anaemia—one that it can, and does, occur without visible loss of blood, even in the absence of occult blood; the other, that it is not such a menace from the operative standpoint as might be expected, and is, in fact, no insuperable barrier to a successful resection. While

there has been a great deal of speculation as to its cause, there can be little doubt that it is largely due to constantly recurring loss of blood in small quantities from the growth, heightened by absorption of toxic material from the involved bowel. It has been shown that there is a definite relationship between the size of the tumour and the degree of anaemia, and it has been pointed out (by Alvarez) that caecal cancers are bathed in the most highly infective fluid to be found anywhere in the body—a fluid full of organisms, which, when injected into animals, produces severe anaemia. The intensity and constancy of this anaemia in carcinoma of the proximal colon may not unreasonably be correlated with the considerable absorptive powers of this part of the large intestine. Flint suggests, as a possible explanation, that urobilin may be normally absorbed from this region, and is altered in some way when disease starts here, so that it cannot take its proper part in the formation of haemoglobin. Whatever the explanation, the anaemia remains as a striking clinical fact.

In the case of an obstructing lesion the course of events is as follows. The narrowing of the lumen at the site of the growth tends to delay the faecal stream, but for a time compensation is effected by the hypertrophy of the bowel above the lesion. As the constriction advances, hypertrophy increases and the more vigorous peristalsis thereby induced results in colicky pains. These pains are attended by rumblings of flatus or borborygmi, and they are made worse by purgatives. Owing to the fact that they are often set in motion by the taking of food, they are frequently ascribed to dyspepsia. One of my patients had dieted herself to the verge of starvation for three months for an "indigestion" which was really due to cancer of the transverse colon. After a time, to the hypertrophy is added dilatation, which most markedly affects the caecum; and during attacks of pain visible or palpable peristalsis may be noted, which, when present, is pathognomonic of obstruction. If the ileo-caecal valve is incompetent the lower coils of ileum are affected by the hypertrophy and dilatation producing the characteristic "ladder pattern." Curiously enough, the patient can often locate accurately the site of the obstruction. As a result of stagnation in the dilated bowel the stools are usually very offensive, and intermittent attacks of diarrhoea are prone to occur. Sooner or later this obstruction becomes acute, being not infrequently precipitated by a purgative—the actual cause being congestion and oedema at the site of the stricture, the impaction of a hard faecal mass or foreign body in the narrow lumen, or, in the case of the mobile segments—sigmoid or transverse colon—to the occurrence of volvulus or intussusception.

Situation of the Growth.

So far we have considered in a general way the effects produced by the two types of growth which occur in the colon. Let us now see how the clinical picture is affected by the situation of the growth.

In the *proximal* colon the growth is usually of the fungating cauliflower type, and forms a definite mass. This mass is situated most frequently at the caeco-colic junction, and because of its bulk and its accessible situation is palpable at a moderately early stage. Ulceration, with its attendant train of symptoms—irritability and anaemia—soon occurs. Obstruction in this segment of the colon is rare, owing partly to the nature of the growth, partly to the fluidity of the intestinal contents, and in part also to the wider calibre of the tube. Alvarez found the diameter of the colon to vary (in Roentgenograms) from 6.5 cm. in the caecum to 2.5 cm. in the sigmoid. Brown found a palpable swelling in 68 per cent. of his proximal colon cases, and in only four cases did carcinoma of the proximal colon cause symptoms of obstruction, in two of which the obstruction was acute.

In the *distal* colon tumour is not often felt (Brown found it in 24 per cent. of his distal colon cases), and practically never in tumours of the splenic flexure, because of its fixed high position under the ribs. Some degree of obstruction is very frequent, owing to the encircling form of growth, the solid contents, and the diminished colon diameter. When the splenic flexure is involved obstruction occurs in practically 100 per cent. of cases.

In the *transverse* colon the growth may be of either type, but in the left end of the transverse colon the sclerosing form predominates, and in this segment, therefore, obstruction is common. A tumour, when present, is characterized by its extreme mobility. Owing to the juxtaposition of the stomach and great omentum, gastric complications are not unusual and the symptoms may be mainly of the dyspeptic type.

The general principle may therefore be stated, with due allowance for occasional departures from type, that in cancer of the left colon obstruction is the rule; in cancer of the right colon obstruction is the exception. Burgess's figures are 87 per cent. and 13 per cent. respectively. This marked difference in clinical behaviour is all the more noteworthy in view of the embryological distinction between the two segments. The right colon, as far as the splenic flexure, is developed from the primitive midgut in continuity with the small intestine, which it resembles in the fluidity of its contents, the absorptive power of its mucous membrane, and in the presence of a retarding mechanism (caeco-colic sphincter and antiperistalsis). The fluid contents make obstruction difficult even in the presence of large and sclerosing growths, while the characteristic anaemia is no doubt partly dependent upon its absorptive function. The left colon is developed from the primitive hindgut, and as the process of absorption is complete with the final loss of water in the transverse colon, it must be regarded mainly as an excreting organ. In view, therefore, of the fact that these two segments of the colon have different origins and different functions, it is not greatly to be marvelled at that they react differently to the carcinomatous process.

The Diagnosis of Colonic Cancer.

By what methods of examination shall we seek to establish the diagnosis of colonic cancer?

1. A careful anamnesis—with particular attention to the onset and persistence of a definite change in the patient's bowel habits from regular to irregular. According to the nature of the growth and the segment of the colon involved, the clinical picture will develop along the lines of an ulcerative or stenotic lesion. It must be remembered that loss of weight and energy occur only in advanced cases.

2. Physical examination. Among the signs or symptoms noted will be anaemia, visible or palpable peristalsis, local distension of the caecum, and in certain cases a palpable tumour. In experienced hands the ordinary stethoscope will often give information of value by demonstrating the gurgling of gas through a narrow opening. The ability of the patient to localize, in many cases, the site of the obstruction should be remembered. A rectal examination may reveal a recto-sigmoid growth when the patient strains, or ballooning of the rectum in the case of growths situated at a higher level. Bimanual examination, aided, if necessary, by a general anaesthetic, often gives information of value.

3. Examination of the stools for visible and occult blood, pus, mucus, and fragments of tumour tissue. In the case of occult blood repeated examinations should be made, a persistently positive finding being strong presumptive evidence of cancer. Hurst states that he has never seen a growth of the stomach or colon where occult blood was not present. Petrén found a positive Weber reaction in the faeces of 35 out of 44 cases examined, and emphasizes the value of a persistently positive Weber reaction in uncertain cases.

As the result of a complete general clinical examination the diagnosis of the site and nature of the growth may be fairly clear. In many cases, however, this is not so, and we must call upon two additional diagnostic aids—the sigmoidoscope and the Roentgen ray. For growth in the lower half of the sigmoid the sigmoidoscope is, in skilled hands, an instrument of the very greatest value, and no one should consider himself competent to handle those cases properly until he has made himself proficient in its use. It not only demonstrates a cancer when present here, but it enables us to recognize the characteristic lesions of ulcerative colitis, to identify papillomata and adenomata,

and, if necessary, to remove portions of tissue for examination. If we bear in mind the important fact that 50 to 55 per cent. of colonic cancers occur in the sigmoid the value of the sigmoidoscope should be readily appreciated.

For those numerous cases where ordinary clinical methods, even when aided by the sigmoidoscope, still leave us in doubt, we have an invaluable ally in the Roentgen ray, which is now justly considered to be the most valuable method of examination in colon conditions. In recent years the opaque meal as a method of colon examination has been almost completely superseded by the opaque enema. In many cases the meal has failed to show a cancer which operation subsequently revealed; this has resulted in negative findings being regarded as a snare and a delusion, with inevitable reaction upon the harassed radiologist. There was also the real danger of precipitating an attack of complete obstruction in stenotic lesions, through the inability of the bowel to rid itself of the barium. Since this happened in one of my cases I have ceased to order opaque meals for patients with suspected colonic cancer. Nowadays, however, with the more frequent use of the opaque enema, the whole picture has been completely changed, and we have at our disposal an agency which makes possible an accurate diagnosis in almost 90 per cent. of cases.

The examination must, of course, be carefully and skilfully performed if sources of error are to be excluded, and the findings must be checked by a second or even a third examination. If stenosis is marked, the enema may be completely arrested at the site of obstruction, thus affording conclusive evidence of blockage. If the enema passes the obstruction the characteristic filling defect with dilatation of the bowel proximal to the growth will be seen. Local spasm may be almost indistinguishable from organic narrowing, but if Carman's directions be followed—that is, administering the enema at considerable gravity pressure in conjunction with antispasmodics and forcible filling of the spastic segment by manual palpation—it is usually possible to make a differentiation. In a similar manner it is possible, with care and patience, to exclude the pseudo-filling defect caused by gas or extra-colonic lesions. Forty-one of Petrén's cases were radiographed, and in 30 of these the opaque enema gave a correct diagnosis; in 4 the appearances were doubtful, and in 7 they were negative. Of the 7 cases 4 could undergo radical operation. It is obvious, therefore, that a negative result must still be received with a certain amount of scepticism, even on repeated examination. In the best hands there is still a small residue of cases in which the *x* rays fail to reveal a growth which is actually present, but with improvement in technique and increase in the capacity for skilled interpretation these cases are becoming very few, and it may truthfully be stated that the opaque enema holds its place as the most reliable method of locating cancer in the colon. It cannot, however, be too strongly emphasized that radiography is only a part, albeit an important part, of the method of investigation. The findings must never be read alone, but only in conjunction with a careful clinical history and a complete physical and laboratory examination. If this is always done there will be very few cases in which we shall be forced to the crude expedient of the exploratory laparotomy, although this, our last line of defence, is one which we are perfectly justified in employing when, after exhaustion of our methods of clinical diagnosis, a reasonable doubt still remains.

DIAGNOSTIC DIFFICULTIES.

1. The ulcerating type of growth may be confused with inflammatory conditions of the colon which cause bleeding and the discharge of mucus and pus—for example, colitis (mucous and ulcerative), polyposis, etc. It is in these cases that the sigmoidoscope helps by revealing the actual lesion in the pelvic colon. In ulcerative colitis the rigid bowel wall will give the typical *x*-ray appearance of a straight tube devoid of haustration—the "ribbon-like" colon. It must, of course, be remembered that polyposis is rare, while cancer is common, and we should be very slow to make a diagnosis of ulcerative colitis of recent onset in an elderly person.

2. It is often difficult to distinguish between cancer of the pelvic colon and diverticulitis. In the latter, apart from clinical evidence of an inflammatory origin, bleeding practically never occurs, and the radiographic appearances are conclusive; these are: rounded, annular, or crescentic shadows projecting beyond the general line of the lumen of the bowel, and, after evacuation of the enema, parallel rows of opaque spots, due to retention of barium in the diverticula, are seen. Again, it should not be forgotten that cancer and diverticulitis may co-exist.

3. Cases with tumour in the right iliac fossa are to be distinguished from early actinomycosis, hyperplastic tuberculosis, and appendicitis. In actinomycosis there is a loss of weight and anaemia, but it generally runs a febrile course. The palpable mass is less definite in outline, and a radiogram may help to show its extra-colonic nature. In actinomycosis, however, as in hyperplastic tuberculosis, unless the clinical diagnosis is reasonably clear, we cannot expect much help from the Roentgen ray, and it is just in this type of case that we are often compelled to resort to operative exploration. Even at operation we may be unable to exclude cancer as the cause of the mass, and it is just here that the individual judgement of the surgeon, based upon his knowledge of what Moynihan calls the "pathology of the living," is of inestimable value in enabling him to recognize the true nature of the case. In appendicitis the short history and local evidence of inflammation should suffice to make the distinction. Strange though it may appear, the reverse mistake of treating a cancer as appendicitis is more likely to be made, the final post-operative diagnosis becoming painfully obvious as the sinus refuses to close and the mass increases in size—a clinical picture also seen occasionally in cases of actinomycosis.

4. Cancer of the transverse colon may be mistaken for chronic intussusception, owing to the existence of a movable tumour. An opaque enema will settle the diagnosis, the appearance after the evacuation of the enema in a case of intussusception being particularly striking. Here again one should bear in mind that a growth may be the cause of the intussusception.

In this paper I have dealt with the diagnosis of cancer of the colon before the onset of acute obstruction. At this stage it is possible to carry out a planned operation for the removal of the growth with the infected lymphatic area, at a mortality rate of about 10 per cent., and of the cases that recover about 25 per cent. are alive at the end of five years. When obstruction has supervened the operative mortality is about 35 per cent., and in many cases only a palliative operation is possible. Unfortunately the obstruction figures are still painfully high. Burgess in a total of 485 cases found acute obstruction in 173 (36.6 per cent.); Brown in 171 cases found it in 43 (25.7 per cent.); and Petrén in 50 cases found it in 21 (42 per cent.). In Brown's series the mortality was 30 per cent. for palliative operations alone.

The importance of making the diagnosis in the precancerous stage is but too painfully obvious, and the rate of diminution of the acute obstruction figures will be the best evidence of the success of our efforts.

LITERATURE.

Dukes, C.: On the Relationship of Simple Tumours of the Large Intestine to Cancer. *Brit. Journ. Surg.*, vol. xiii, 1926.

Lockhart-Mummery, J. P., and Dukes, C.: The Precancerous Changes in the Rectum and Colon. *Surg., Gynecol. and Obstet.*, vol. xlvi, 1928.

Saint, J. H.: Polypi of the Intestine. *Brit. Journ. Surg.*, vol. xv, 1927.

Alvarez, Judd, McCarthy, and Zimmermann: *Collected Papers of the Mayo Clinic*, 1927.

Flint, E. R.: *Brit. Journ. Surg.*, vol. xiv, 1927.

Petrén, G.: *Acta Chirurgica Scandinavica*, vol. lxiii, 1928.

Brown, K.: *Edin. Med. Journ.*, 1926.

Rankin, Fred. W.: *Surgery of the Colon*, 1926.

Burgess, A. H.: A Lecture on Cancer of the Gastro-intestinal Tract. *British Medical Journal*, 1927, i, p. 1.

Ogilvie, W. H.: *Recent Advances in Surgery*, 1928.

Burgess, A. H.: *Lancet*, August, 1923, 295.

Lockhart-Mummery, J. P.: The Treatment of Obstructive Lesions of the Colon. *British Medical Journal*, May 28th, 1927, p. 950.

Rowlands, R. P.: Carcinoma of the Colon. *British Medical Journal*, January 15th, 1927, p. 95.

Ochsenhirt, N. C.: Mucus-forming Cells in Carcinoma of Large Intestine. *Surg., Gynecol. and Obstet.*, vol. xlvii, July, 1928.

Fowler: *Surg., Gynecol. and Obstet.*, vol. xliii, July, 1926.

STATE OF THE ARTERY AND THE CIRCULATION UNDER THE SPHYGMOMANOMETER CUFF DURING COMPRESSION.

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IT is generally assumed that the lumen of the brachial artery is completely obliterated when, in the course of a blood pressure estimation, the pulse at the wrist ceases to be palpable, and on the face of it this assumption appears almost to be self-evident. Moreover, has it not the sanction of physiologists generally? Consult here the figure in Starling's *Physiology* (1926, p. 806), also Howell's textbook (1927), and Gallavardin's figures reproduced in Halls Dally's *High Blood Pressure* (1926, p. 42)—nothing could be more categorical and plain to see. In spite of all this I have been driven to doubt the *fact*, and this doubt has grown in strength with further consideration. May I be allowed to produce my reasons? I must add that this is not an academic question for mere debate; it is a plain matter of fact or not, and it raises a definite practical issue in respect of the interpretation of the manometer readings.

Reaction of the Tissues to Compression.

To begin with, then, as we are dealing with compression and compressibility, it must be asked, Are the so-called soft parts of the arm—Gallavardin's *parties molles*—rightly thus named? They consist of adipose tissue, muscle fibre, and a fibrous framework which embeds and encapsules; further, of a system of vessels, blood- and lymph-containing, which ramify through the whole mass; we can probably omit the consideration of the last-named, the lymphatics, as negligible. Enclosing this tissue-complex is the dense exoskeletal structure of the skin, more or less loosely tied to the deeper parts, and, completing the list of factors which enter into the problem, there is the central core of bone, which presents its rigidity to serve for attachment as well as to supply a surface for counterpressure.

Now there will be no doubt in our minds as to the unyieldingness of the bony core; is there any as to the yieldingness of the "soft parts"? *Fiat experimentum*—thrust the thumb forcibly into the mass of the biceps; does it not sink in, and does this not settle the question? No, for another interpretation offers—namely, that within certain limits these parts are free to move and that the thumb has just thrust them aside; in other words, the experiment has shown displaceability—not compressibility—and it must be repeated, with displaceability ruled out. This can be effected most readily by enlarging the area of compression, and it is secured by the cuff of the sphygmomanometer, which not only covers a large area but envelops the whole circumference of the arm in its grasp. Thus conditioned, when the instrument is put into action do we as a matter of observation see any appreciable displacement of the soft parts either above or below the cuff, or does the cuff sink in, as did the thumb? Again the answer is No; a little puffiness above its upper edge and a similar slight puffiness below the lower edge, together with a moderate general tumefaction and a duskiness of the forearm, is all that is noted (the last-named appearances find their explanation in certain congestive circulatory effects). There is accordingly no evidence of a displacement of the parts from under the cuff, either distally or proximally, nor of a yielding of the soft parts to the pressure of the cuff. Gallavardin's figures have, therefore, no foundation in fact, and the term "soft" parts is a misnomer; all that the thumb and cuff experiments have established is that the tissues are more or less mobile—displaceable, but not compressible within the pressure range of the manometer.

On *a priori* grounds the same conclusion might have been reached, for of the parts in question the adipose tissue consists of a mass of cells filled with fat in the liquid state; while the muscle substance is so heavily hydrated that in the living state it exists as a jelly, more or less fluid; and the blood is a liquid, which, though eminently displaceable, *given the outlet*, not so favoured behaves like other liquids and resists enormous pressure, in comparison with which the 100 to 300 mm. of mercury of the manometer scale are absolutely negligible.*

The position, then, at which we have arrived is that under the conditions secured by the sphygmomanometer the immobilized tissues are incompressible; further, that, regarding their liquid and semi-liquid state, we are justified on physical grounds in assuming that they will behave like other liquids; consequently that any pressure applied to the surface of the imprisoned area under the cuff will be transmitted immediately, uniformly, and without diminution throughout the substance of the cuff segment of the arm, for at each stage of the investigation, as the column of mercury halts in its ascent, the opposing forces are equilibrated, and the problem before us becomes one of hydrostatics, such as is exemplified exactly by the Bramah (hydraulic) press.†

This brings us to the subject proper of this paper—namely, the state of the artery and the behaviour of the blood stream under the rising pressure in the cuff of the instrument. It will make for clearness if we consider these effects in the following order: (1) in the arm below the cuff; (2) in the arm under the cuff; and (3) in the arm above the cuff.

1. *Effects in the Segment of the Arm Distal to the Cuff.*

These will be just those of a ligature round the arm. The ligature is very broad and its constrictive force is developed gradually, but on neither of these counts does its mode of action differ from that of any other ligature, in that it impedes both the entry of blood into the segment in question and still more markedly its escape therefrom; for the thin-walled low-pressured veins, in particular those of the surface, will be the first vessels to feel and yield to the pressure of the cuff at its lower border, and the first squeeze of the ball should suffice to close them. The deeper veins would follow suit quickly, for the cuff pressure effectually prevents any displacement of the tissues of the forearm, and these, becoming at once incompressible, transmit rapidly the surface pressure to the deeper parts. The primary effect therefore is venous obstruction along the line of the lower border of the cuff, with consequent gathering of the blood behind the obstruction, a movement which must work backwards towards the capillary fields and through these to the arterioles, leading ultimately to more or less arterial overfilling—in brief, to a choked state of all the vessels. It will, however, be noted that this general congestion is predominantly venous, and further that the accumulation of blood will again be most marked in the superficial veins, because the loose skin offers less resistance than the deeper parts.

These effects will continue throughout the duration of the experiment, and the surcharged vessels, therefore, will oppose an increasing resistance to the entry of blood from the cuff segment of the arm.

2. *Effect in the Cuff Segment of the Arm.*

In contradistinction to the line of pressure (that of the lower edge of the cuff) which is responsible for the above-described effects, we must now regard the consequences of a broad circular area of pressure which the cuff lays upon the whole of this segment. The skin is now immobilized along with all the other tissues; everything outside the walls of the vessels is, therefore, incompressible, and so the full force of the cuff pressure is brought to bear upon the blood, which, though *per se* incompressible, is not only displaceable, but is in act of displacement along a given line—that of least resistance.

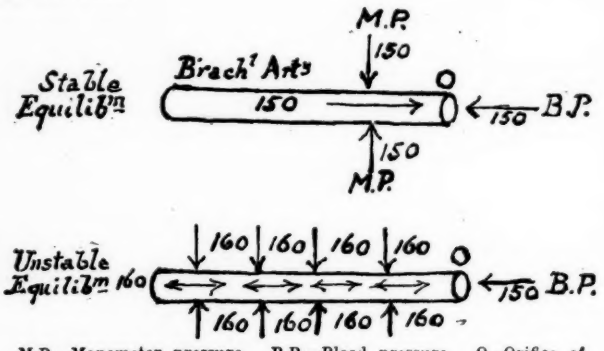
* Professor A. W. Porter of University College informs me that there are no data available as to the compressibility of bodies in the colloid or jelly state, but he holds it as almost certain that they will come close to liquids in their incompressibility.

† Exactly, in so far as the extravascular tissues of the arm are concerned, but through the blood vessels which permeate the tissues a flow of blood is all the while being maintained, and this complicates the physical problem, introducing a dynamic factor. However, this disturbing factor diminishes progressively as the experiment proceeds, and in the end, when the blood pressure is determined, it vanishes wholly with the arrest of the pulse.

Let us apply this to the state of things at the very commencement of the experiment. The blood is in actual movement through the vessels under a pressure which falls progressively from the arteries to the capillaries and from these to the veins, the ultimate destination of which is the right ventricle. Accordingly the internal blood pressure will be at its lowest, in this segment, at the mouths of the veins as they emerge from the upper edge of the cuff. Above this point the fall continues, and it is accentuated where the veins enter the chest by an actual *minus* pressure; there is, therefore, no impediment along this route; indeed, the *minus* intrathoracic pressure *favours actively* the centripetal flow. What, then, must follow when the encircling cuff begins to exert its grasp? The emptying of the veins must be accelerated, and in this process the superficial veins, which first feel the pressure, will take precedence. But very rapidly the surface pressure will be transmitted to the deep veins, and these will suffer a like emptying. An end to this depletion, however, must come as the walls of the veins flatten out and come into contact under the rapidly rising external pressure: thence onwards they are effectively sealed. How far back towards the capillary fields, or perhaps even into them, the emptying proceeds can only be determined by direct observation, for it is impossible to gauge *a priori* at what point the intra-arterial pressure which is striving to fill the veins will counterbalance the opposing pressure on the veins, which after the completion of the *forward* emptying process will now be directed *backwards*. Thus the primary effect of loading the surface of the cuff segment will be an emptying of the veins more or less, probably to a considerable extent —an effect exactly the opposite of that witnessed in the distal segment.

From the moment of the sealing of the veins, at this or that point, the circulation is interrupted up to the point of emergence of the veins from the upper edge of the cuff; but blood is still being squeezed into the arteries of the segment, though under increasing difficulties, so long as the intra-arterial blood pressure exceeds that in the extravascular tissues; the arteries, therefore, at this stage will perforce be all open.

The next step brings us to equality of the two opposing forces—that of the column of mercury in the manometer and that of the intra-arterial blood pressure; let us assume this to be 150 mm. The following diagram will represent the situation.



M.P.=Manometer pressure. B.P.=Blood pressure. O=Orifice of brachial artery at upper level of cuff.

Stasis is now complete, for no blood can enter the artery; *at the same time the artery maintains its patency*, for there is no surplus of force to compress its lumen, and we have before us a given volume of blood imprisoned between the orifice of the artery and the sealed veins. The problem has thus become one of hydrostatics pure and simple, which may be indefinitely prolonged, *ceteris paribus*. We must further note that along with the cessation of all movement of the blood the pressure throughout this fluid is of necessity equal in all the vessels remaining patent.

Let us now suppose that the next squeeze of the ball raises the manometer pressure to 160 mm.; what will happen? By an excess of 10 mm. the equilibrium will have become unstable, and this surplus is brought to bear upon the whole volume of blood; what will follow? The imprisoned fluid will seek an outlet, pressing equally in all directions, both peripherally towards the veins and centrally towards the heart *by way of the arteries*. But there is no thoroughfare peripherally, for there the sealed veins are held by the same excess of pressure as that which seeks relief. In like manner, at any given point along the vessels up to the brachial trunk itself, any attempt to shift the blood towards the veins will be countered—thus, up to the orifice O in the diagram, where an excess of 10 mm. finds itself unopposed. What then must follow, theoretically, is that the fluid will begin to dribble out backwards, reversing the normal circulation; there is no help for it.

In actuality a surplus force of 10 mm. in the face of the inertia of the *mass* of blood to be moved, against the surface resistance opposed by the multiple branching channels which contain it, would, without doubt, be imperceptible, certainly negligible; but, even so, we must note that a surplus of 10 mm. Hg (the apparent stasis still persisting) holds open the orifice at O. And actually, if we should push the experiment to a really appreciable extent—say to readings of 300 mm. or more—then an appreciable *expression* of the blood would be inevitable. But again what follows?—the orifice will still *be kept open* by the expulsive force until the last *quantulum* of blood has been driven out. Of course, the patency of the lumen of the vessels will, in that case, be gradually diminished as the volume of the blood to be expressed diminishes.

Within the time limits of a blood estimation, however, in which we should raise the manometer reading to 20 or 30 mm. above the pressure necessary for the extinction of the pulse, there will be no chance for these small surpluses of such short duration to effect any perceptible reduction of the volume of the imprisoned blood—the containing arteries therefore would remain fully patent.

On these grounds I am compelled to conclude that the theory of an obliteration of a section of the brachial artery in explanation of the extinction of the pulse is wholly untenable. I would, moreover, point out that any argument which could be brought forward in favour of the obliteration of the brachial artery by the outside pressure on its walls would hold equally for every other artery in the cuff segment of the arm, since its internal blood pressure could not exceed that in the brachial artery. But what force could conceivably shift all this blood, and where could room be found for it? Per contra if this is so, if the arteries keep their patency throughout, how do we explain the extinction of the pulse at the wrist at a given moment, which is an indisputable fact?

A reasonable answer to this question is, I think, not far to seek, but it involves certain preliminary considerations. The first is that the blood flow results from variations in blood pressure along the course of the vessels, and that this blood pressure is caused by the elastic stretch of the entire arterial system, but mainly, perhaps, by the elastic stretch of the aorta, which acts as a transformer between the power chamber of the ventricle, where all the energy is generated, and the capillaries. This action resembles exactly that of the elastic bag of the Spray apparatus, which, intervening between the ball and the nozzle, converts the intermittent grasp of the hand into a continuous efflux from the nozzle.

The elastic stretch of the arterial system—in which how many ventricular systoles are summed up?—absorbs the whole of the cardiac energy, the intermittent generation of which disappears quite by the time the capillaries are reached, and in the form of the elastic recoil it figures as the blood pressure, which measures the strength of the stretch. This is the sole cause of the blood stream. The fingers on the artery take no cognizance of it except as to the volume of the stream and the intravascular tension.

The pulse, on the other hand, is a manifestation of an entirely different order; it plays no part in forwarding the blood; it is an epiphenomenon, something superadded, and, seemingly, both unproductive and undesirable; for while it carries force in its progress along the arteries, the force is not available for circulatory purposes, yet it subjects the arterial wall to an additional strain, which may and does become a danger in disease. In a certain sense it runs counter to the purpose of the elasticity of the arterial wall, for it makes to reappear an intermittence which the elasticity has been at pains to suppress. In brief, it is

a percussion wave, which, arising at the aortic orifice, *quodam modo*, courses through the arteries at the rate of about 7 metres per second, whereas the blood stream is never faster than 0.5 metre per second.*

It must be obvious that these two velocities cannot be effectively harnessed to the end of one co-operative act. That which the finger on the artery takes note of, then, is the passage of a wave, and the impression gained is that of a lift, which is confirmed by physiologists, who teach that in the act of passing the artery is *expanded and lengthened*. Evidently the wave carries force.

Now let us take the stage of equipoise between the intra-arterial pressure—that is, the pressure caused by the arterial elastic recoil—and the opposing manometer pressure, when stasis supervenes; the pulse wave will, of course, present itself as usual at the mouths of the arteries, which are all open. Will it enter as usual? Why not?—it carries force; what is there to forbid? Well, there is no current to carry it. The answer to this is, it needs no current; it is not conveyed; it rides the blood stream and forces its way. We know that the percussion wave started by the cast of a stone travels as freely along the surface of a standing pool as over the smooth surface of a river, and in all directions, even against the stream. It will, therefore, enter and must reach the wrist, as usual, since the elasticity of the containing walls is not exhausted.

And now let us give another squeeze of the ball; the manometer rises, say, 10–15–20 mm., but the pulse is suddenly gone—why, if the arteries are still patent? For the simple reason that this new rise of extravascular pressure, caused by the squeeze of the ball, will then have sufficed to meet and cancel the expanding force value of the pulse wave; the arterial wall will thus be prevented from yielding and the wave cannot pass, though the channels are all open. This is the reasoned explanation now proffered to show that it is not necessary to invoke obliteration of the artery, to account for the extinction of the pulse at the wrist, in the process of taking the blood pressure; and in the foregoing I have endeavoured to demonstrate that on physical grounds the obliteration hypothesis is untenable. It remains that the reasons advanced should be tested.

Bacon has said: "*Visio oculorum melior est quam progressio animi*," which I suppose may be rendered "the sight of the eyes is better than the mental process"—that is, ratiocination—and one must agree that a simple act of perception would save much excogitation and debate. But in the absence of sight by the external eye (for who has seen the closed artery?) what remains but the mind's eye to probe the validity of a hypothesis which is, as it stands, a pure assumption?

It has been said that the subject is not merely academic in that it raises a definite practical issue—namely, that from the beginning of the use of the sphygmomanometer—on the assumption of arterial obliteration, it has been a moot point what proportion of the pressure readings is to be allotted to the intra-arterial tension, and what to the resistance of the arterial wall itself (this latter a very variable quantity, when in disease the artery becomes thickened and hardened). Persistent patency of the arteries would eliminate this question once for all.

*Compare Starling, op. cit., fourth edition, p. 819; also Wiggers, *Circulation in Health and Disease*, 1923, p. 190.

ILEO-CAECAL VOLVULUS FROM ADHESIONS FORMED BY LEFT-SIDED PELVIC APPENDICITIS.

BY

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THE following case is of interest in regard to diagnosis and development. Moreover, it is a commentary on the dangers of incomplete anchorage or fixation of a viscus that has been hitherto free.

The patient, a spinster aged 33, was admitted to hospital as an acute abdominal emergency. Twelve hours previously she had been seized by violent griping pains in the left lower abdomen, accompanied by vomiting. No flatus had been passed since the onset of the attack, and the bowels had moved on the day before the attack. There had been no menstrual irregularity. There was a history of chronic constipation and occasional attacks of indigestion, confined to the region of the left iliac fossa.

The patient did not look ill. The temperature was normal, and the pulse rate 96 per minute. The tongue was furred. The abdomen was scaphoid and characteristic of the slender congenital visceroptotic type of anatomic structure. It moved freely on respiration, and some distension was present. The patient complained of pain in the left iliac fossa. There was deep-seated discomfort on pressure in this situation, but no tenderness or muscular rigidity. Pelvic examination was negative, as also was the obturator test for pelvic appendicitis. Succussion was present about the umbilicus, a sign of the greatest importance in the early stages of obstruction of the small intestine.

The case was regarded as one of acute intestinal obstruction. The abdomen was opened by a mid-line infra-umbilical incision. Coils of ileum, moderately distended, were packed off. The pelvic colon was empty. The caecum and appendix were not in the right iliac fossa. The ascending colon, longer and much more mobile than the normal, being provided with a mesentery, was traced into the pelvis. The caecum was lying in the true pelvis, distended and completely filling it. Attempts to extract it from the pelvis were resisted until adhesions binding down the appendix to the left side of the true pelvis had been divided. In delivering the incarcerated caecum a volvulus of the ileo-caecal segment of the bowel was discovered. Rotation in a clockwise direction had taken place through more than half a circle, round the axis of the appendix, adherent to the left side of the pelvis. The bowel was quite viable. After correction of the volvulus the appendix was removed and caecal plication performed. The patient made a good recovery.

The caecum and ascending colon were extremely mobile in this case, being provided with a long mesentery. Such a state of affairs is not uncommon in the slender congenital visceroptotic type of individual. The caecum was thin-walled, atonic, and dilated, thus showing commencing failure of compensation, from long-standing difficulty of emptying. The appendix was cicatrized in its terminal portion, and the lumen in the distal half nearly obliterated. Obviously it had been affected by former inflammation. The previous attacks of left-sided abdominal pain supported this finding. Ultimately the appendix became fixed by adhesions to the left side of the pelvis. The hitherto mobile caecum became thereby insecurely tethered, and volvulus of the ileo-caecal segment took place.

Interest in atypical cases of appendicitis is sometimes associated with abnormal positions of the caecum and large intestine due to errors of rotation and fixation. The errors of mal-rotation and non-rotation of the midgut loop are those most likely to undergo volvulus change, and are usually, though not always, met with in the childhood period. In the adult it is the errors of the third stage of rotation, in which the viscera find their ultimate position of fixation to the posterior abdominal wall, that occur. Premature or high fixation of the caecum or failure in elongation of the colon results in an undescended caecum. Appendicitis in such a case may be difficult or impossible to distinguish from cholecystitis. Deficient fixation or abnormal elongation of the colon results in the low pelvic type of caecum. In the present case the attacks of appendicitis were atypical, being pelvic and left-sided. Intussusception in childhood and visceroptosis in the adult are intimately associated with this type of anatomical structure. Ileo-caecal volvulus is also associated with a low pelvic type of mobile caecum. To the incomplete fixation of the caecum produced by the adhesions around the appendix is to be ascribed one of the exciting factors concerned in its production in the present instance.

The case is an interesting example of an anatomical structure varying quite definitely from the normal, but which functioned fairly well until the introduction of another factor led to serious risk to function and to life. Nature's incomplete efforts at "caecopexy" were certainly disastrous in this case. May it not be argued, therefore, that fixation operations are essentially unphysiological in congenital visceroptosis? It seems to me that they are based upon an incomplete understanding of the altered anatomical structure and function of the individual as a whole. General methods of physical education and support would seem to meet the need in the majority of cases.

THE TREATMENT OF TUBERCULOSIS OF THE LUNGS BY SANOCRYSIN.

BY

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IN these notes we do not propose to say anything on the history of sanocrysin since its introduction by Moellgaard in 1923. The story of its discovery, with the early method of its employment and subsequent modification, is readily available in the now extensive literature. Our purpose is to relate our experience of its use in 45 cases during the past two years, with special reference to the most suitable type of case for treatment, the dosage and length of treatment, and to give our conclusions as to its value as a therapeutic agent in pulmonary tuberculosis. As the various complications are now so well recognized they are merely mentioned in passing.

In all cases tubercle bacilli were present in the sputum at the beginning of treatment. This point is stressed since so often various treatments have been apparently successfully employed in tuberculosis in the absence of unequivocal proof of its presence. The value of early treatment in "closed" cases is not disputed, but for scientific records it is essential that there should be no shadow of doubt as to diagnosis.

All the 45 cases were in Stage II or Stage III, mostly the latter, and in all there was a preliminary period of routine (sanatorium) treatment without definite improvement. All the patients were under sanatorium regime during treatment.

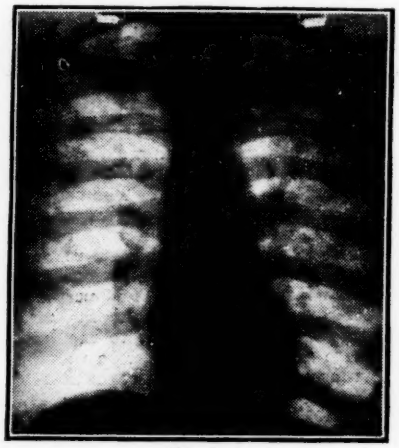

FIG. 1.

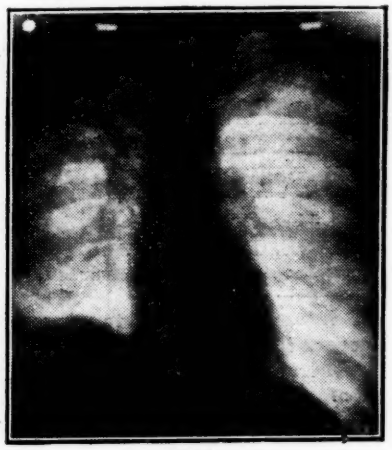

FIG. 2.

Selection of Suitable Cases.—It has been abundantly shown that the type of case most likely to benefit by sanocrysin is that showing the "exudative" variety of lesions. This type is recognized on the *x*-ray film by the fluffy, wool-like appearance of the areas of density generally scattered through both lungs. (Fig. 1.) This contrasts with the sharper and more defined areas of density, often unilateral, in the fibroid type of the disease, and frequently accompanied by old cavitation. (Fig. 2.) These differences are easier to determine on the *x*-ray films than in reproductions. Certain cases may show densities of both recent and old-standing disease.

Clinical Signs.—On clinical examination in the first (suitable) type there is only slight impairment of percussion note and weak breath sounds, with medium-sized crepitations; whereas in the second (unsuitable) type are found shrinkage, marked dullness, loud bronchial breath sounds, and consonating rales.

Contraindications.—The following are the chief contraindications. (1) Cases of fibroid phthisis. (2) Cases with gastro-intestinal symptoms. (3) Cases with symptoms of marked toxaemia—for example, fever above 101°, profuse night sweats, rapid emaciation. (4) Renal disease (sanocrysin produced slight evanescent albuminuria in the majority of cases). (5) Any other systemic disease—for example, diabetes.

Sanocrysin must only be given cautiously, if at all, to patients complaining of abdominal pain or loss of appetite. Vomiting, diarrhoea, and loss of weight are common complications of this therapy, and are especially apt to occur in these cases.

Case 1.—Male, aged 20. Appetite poor; steady loss of weight. As the appetite was improving sanocrysin was given. On the day following the first dose the patient complained for the first time of "indigestion." On the day after the third injection (0.125 gram only) the patient had diarrhoea and abdominal pain. Both these symptoms became worse and sanocrysin had to be abandoned. Previous to treatment by sanocrysin the patient was inclined to be constipated.

Indigestion *per se*—that is, epigastric pain after food, flatulence—is not a contraindication. The gastro-intestinal symptoms referred to above in all probability represent a manifestation either of abdominal tuberculosis or come under Group (3).

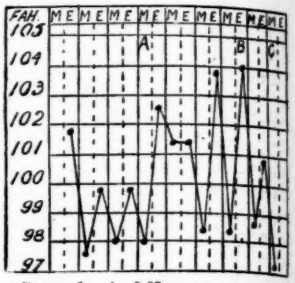

CHART 1.—A, 0.05 gram sanocrysin (fifth injection of same amount). B, Antipyretic treatment. C, Sanocrysin discontinued; no definite increase in focal signs.

Case 2.—A boy, aged 12, with signs of disease in both upper lobes, more extensive on the left side. The temperature before injections were given was 98° to 101° F. After two injections (0.05 gram) there was no change. It was higher after the third and fourth injections of the same amount, and still higher after the fifth injection (see Chart 1). This increase of reaction suggests a cumulative effect of the drug. There was no increase in focal signs, but treatment was abandoned because of the hyperpyrexia. The patient died several months later.

Tuberculous laryngitis is not a contraindication; on the contrary, it tends to improve under sanocrysin therapy. In one of the cases under review there was a granuloma (lupus) of the epiglottis. This condition improved greatly with sanocrysin alone, no local treatment being applied.

Mode of Action.—The apparent action of sanocrysin is especially interesting to anyone familiar with the use of tuberculin. Following the administration of sanocrysin there may be the same rapid rise and fall of temperature as occurs after a diagnostic injection of tuberculin. A focal reaction is also not uncommon, and, as with tuberculin, it is very difficult to say how far its effect is harmful. It has been shown by various writers that there is frequently a rapid breaking down of tissue and cavity formation after the use of sanocrysin. Is it possible that this may be accompanied by the liberation of tuberculin?

Advantage over Tuberculin.—A great advantage of sanocrysin over tuberculin is the possibility of its use in cases of moderate pyrexia where tuberculin would be inadmissible.

Disadvantages.—(1) Expense is a grave disadvantage, an average course in this country costing about £4 5s. for the gold salt alone. (2) Close observation is necessary; this militates against the use of the drug by the general practitioner. (3) Patients weary of the more or less complete confinement to bed for the duration of the treatment, and may, in fact, refuse to continue treatment on this account. As a consequence, for the past six months we have allowed patients whose pulse rate and temperature are within normal limits and who are free of any adverse effect of the drug to get up for from two to seven hours daily. Patients remain in bed, however, on the day of the injection and the day following. As far as we can see, no bad results have been caused through this latitude.

An increase in pulse rate is regarded as of more importance than a rise of temperature, and in our opinion is a valuable factor in the consideration of prognosis. At the Osler Pavilion the practice has been gradually evolved of giving small initial doses, increasing slowly and steadily,

avoiding, as a rule, reactions greater than one degree. Chart 2 illustrates the case of a woman, aged 33, who did extremely well on sanocrysin and who yet always had a rise of temperature of about 2°. How to control these temperature reactions is one of the many problems in sanocrysin (and tuberculin) therapy. Anything severe in the nature of systemic disturbance, such as albuminuria or diarrhoea, should be avoided, and if these or other complications occur further doses should not be given before they have cleared up.

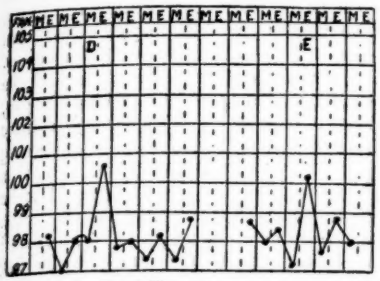

CHART 2.—D, 0.35 gram sanocrysin. E, 0.45 gram sanocrysin.

The dosage of an average course would be somewhat as follows, modified, of course, according to the reaction; the drug is given intravenously at weekly intervals—for example, 0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.75, 0.85, 1 gram, the last dose being repeated two or three times. In female patients, as a general rule, 0.75 gram is the highest dose given, and is repeated once or twice. The average total amount given (exclusive of those cases where the treatment had to be abandoned for various reasons) has been approximately: men, 6.1 grams (10 doses); women, 5.8 grams (13 doses). Frequently reactions become more severe with the larger doses, and renal, gastro-intestinal, or skin complications develop, necessitating cessation of treatment.

Loss of weight quite often occurs, and may be considerable, causing interruption of treatment. As a rule the weight is quickly regained. It is unusual for a course to be completed without some reaction. Malaise and headache are frequently complained of, and drowsiness occasionally. In several cases treatment had to be abandoned because of complications which persisted.

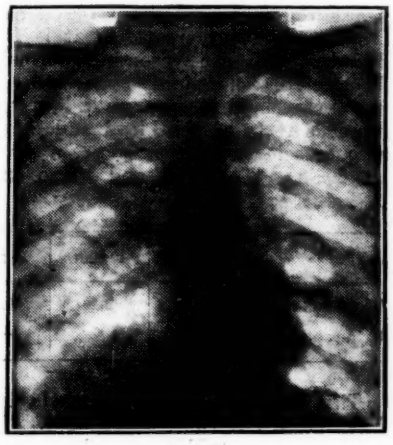

FIG. 3.

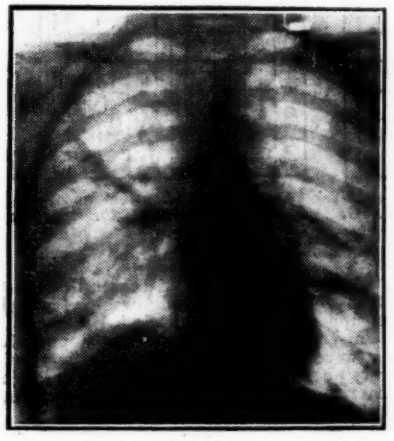

FIG. 4.

In the majority of cases the physical signs appear to have cleared more quickly than in all probability they would have done otherwise, although at first there may have been an apparent increase. This improvement is verifiable by *x*-ray films (see Figs. 3 and 4). In this particular case these were taken at an interval of less than three months. In these photographs an effort has been made to standardize, as far as possible, the time factor, the distance of the patient from the tube, the strength of the current, and the development of the films. The sputum eventually tends to decrease, although at first it may increase, especially in patients who have had little sputum. Tubercle bacilli disappear in most cases, though unfortunately they frequently, in fact generally, return some weeks after cessation of treatment. On the other hand, the physical signs, and more especially the general condition, appear to improve, and continue to do so after the treatment has ceased, which may be regarded as due to a cumulative effect of the drug.

Results of Treatment (45 Cases).

Definite improvement (physical signs and general condition)	25
Improvement but subsequent relapse...	2
Treatment abandoned (complications and general condition)	10
Treatment not completed (patient left hospital) ...	3
No improvement (worse 3, unaltered 2)	5

It would perhaps be more correct to add the 10 patients in whom treatment was abandoned to the 3 classified as worse.

Illustrative Cases.

In the following notes L represents the extent of the lung lesion, and S the degree of systemic disturbance as evidenced by the temperature range, or even more by the pulse rate. This classification is modified from that of Philip.

Many of the cases admitted to the Osler Pavilion during the past two years have been of the acute bronchopneumonic type, with an illness of short duration, following so-called influenza. How far this conforms to admissions in other areas we are not in a position to say.

Cases Much Improved.

1. A girl, aged 18; admitted December 20th, 1927, with extensive involvement of the left lung and upper right zone; onset June, 1927. The evening temperature was 101° F., pulse 76 to 96; L3, S3. She received in all 3.45 grams of sanocrysin, and was discharged on May 2nd, 1928; L2, S1. She gained weight under treatment. The sputum was always scanty; none on discharge. December, 1928: Condition satisfactory.

2. A youth, aged 19; admitted October 29th, 1927; onset "influenza" and pneumonia, March, 1927. Extensive signs in left lung and right upper zone; the larynx was slightly affected. Evening temperature 99° F., pulse 84 to 100; L3, S2. The disease progressed in spite of routine treatment and tuberculin. The total amount of sanocrysin given was 6.7 grams. He was discharged on September 21st, 1928; the physical signs, *x*-ray appearances, and larynx had all improved. The sputum was scanty, but still positive. December, 1928: Condition satisfactory.

3. A man, aged 22; admitted March 12th, 1928; onset, summer, 1927, with lassitude and cough. Extreme lassitude and cough were the chief symptoms. Both upper zones were affected—L3, S3. The evening temperature was 100° F., pulse 96 to 112. He was given 5.8 grams of sanocrysin. On discharge L2, S1; a few bacilli were still present in the sputum. The physical signs and *x*-ray appearances showed definite improvement; the lassitude had gone. December, 1928: Condition satisfactory.

4. A girl, aged 12; admitted August 7th, 1927; onset "influenza," Christmas, 1926. The evening temperature was about 100° F.; pulse 80 to 100. There were extensive signs in the right upper zone; the chief symptoms were cough, anorexia, and lassitude. In all, 9.575 grams of sanocrysin were administered. The loss of weight towards the end of the course was quickly regained after its completion. On her discharge the sputum was scanty and negative. December, 1928: "Holding her own."

In view of the well-known evil prognosis at this age this case is regarded as satisfactory.

5. A girl, aged 18; admitted November 21st, 1927; onset September, 1927. Both upper zones were affected. The evening temperature was 99° F. L2, S1. She was given 4.3 grams of sanocrysin, and, after an interval of eight weeks, a further 2.95 grams. Sputum, which had always been scanty, was absent on discharge. The physical signs were much improved.

6. A woman, aged 22; admitted January 31st, 1927; onset November, 1926. The left upper zone and right apex were involved; L2, S1. The evening temperature was 99° F. She improved on routine treatment, but subsequently developed an increase of physical signs in one lung, with an evening temperature of 100° to 102°. She received a total of 8.25 grams of sanocrysin. When discharged, on January 23rd, 1928, the physical signs had improved; one or two isolated and broken down bacilli were seen.

7. A man, aged 39; admitted February 2nd, 1928; onset, haemorrhage, January, 1927. There was extensive disease of the left lung, and right upper and middle zones; L3, S1. The evening temperature was subnormal, pulse 76 to 92; sputum 6 oz. Sanocrysin to a total amount of 4.9 grams was administered. He was discharged on July 14th, 1928, with the physical signs much improved, and the sputum scanty and negative.

8. A man, aged 33; admitted February 21st, 1928; onset December, 1927. There was extensive disease of the left lung and slight disease of the right; L3, S3. Temperature swinging to 101° F., pulse 96 to 116; sputum scanty. He was given 5.35 grams

of sanocrysin. He was discharged on August 15th, 1928, with a normal temperature and pulse 72 to 92; there was no sputum. The physical signs and *x*-ray appearances were much improved.

9. A woman, aged 33; admitted March 3rd, 1928; onset December, 1927, "influenza." Most of the right lung was affected, and the left middle zone; L3, S2. Sputum was scanty. Evening temperature 99° F., pulse 84 to 120. She received a total of 4.5 grams of sanocrysin. When discharged, on June 5th, 1928, there was no sputum and the physical signs were much fewer; the improvement had been very rapid in a short time.

10. A woman, aged 24; admitted October 29th, 1927; onset August, 1924, pleurisy. There was extensive disease on the right with cavitation, and slight disease on the left; L3, S2. Sputum 3 to 4 oz. The evening temperature was 99° F., pulse 88 to 108. She was given in all 6.6 grams of sanocrysin. She was discharged on April 12th, 1928, with the physical signs much improved, sputum 1/2 oz., bacilli fewer but still present. The general improvement was maintained. She was readmitted on October 22th for a second course of sanocrysin (3.6 grams). When discharged, on December 22nd, there was further improvement in the physical signs and the sputum was negative.

Cases in which Patients became worse and where the Disease was probably aggravated by Sanocrysin.

11. A woman, aged 34; admitted June 25th, 1928; onset February, 1926. L3, S3. There was extensive disease of both lungs. The evening temperature was about 100° F., pulse 88 to 108. Small doses of sanocrysin were given after the temperature had been allowed to settle. After the fourth injection the patient had haemoptysis with fever (see Chart 3). There was no previous history of haemoptysis. The physical signs had increased.

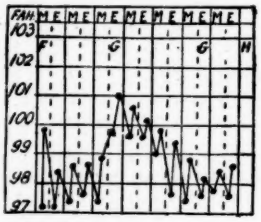

CHART 3.—F, 0.1 gram sanocrysin (fourth injection). G, Haemoptysis. H, Signs of extension of disease.

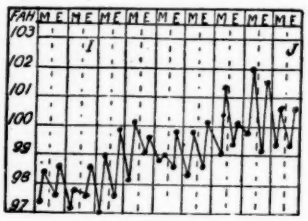

CHART 4.—I, 0.3 gram sanocrysin. J, Fever continued for fourteen days longer.

12. A woman, aged 22; admitted May 3rd, 1928; onset December, 1926. L3, S2. Pulse 96 to 132. The left lung was extensively involved, and the right upper zone was affected. Dermatitis occurred after the second injection, and treatment was stopped for four weeks. Seven doses were then given at weekly intervals. The temperature was rarely above 99° F. After the last injection the temperature began to rise and the patient had a continuous pyrexia with increase of physical signs (see Chart 4).

Conclusions.

We recognize the possible fallacies in attempting to draw conclusions in a disease where the unexpected so often happens, even in the absence of any form of treatment, and especially where more than one form of treatment has been employed. But after mature consideration we feel justified in making the following statements.

Sanocrysin cannot be regarded as a specific in the treatment of pulmonary tuberculosis. In suitable cases it shortens the period of routine treatment—that is to say, a similar degree of improvement may be obtained in considerably less time with sanocrysin than without.

With sanocrysin there is a greater possibility of the improvement following institutional treatment being maintained than there is without its use.

In carefully selected cases it is of value as an adjuvant to other methods of treatment. It is of definite worth in clearing the "better" lung in bilateral disease and allowing the establishment of an artificial pneumothorax on the "bad" side. It may also be employed with advantage in collapse therapy, of any variety, when there is a tendency for the "good" side to break down.

Used with care it is of value in the treatment of the acute exacerbations in chronic fibroid disease.

By ridding the sputum of bacilli even for a short time it must—theoretically, at any rate—limit the spread of the disease.

Sufficient time has not yet elapsed to allow us to dogmatize on the permanency or otherwise of the improvement.

CASES OF DIABETES MELLITUS WITH A LOW RENAL THRESHOLD.

BY

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THE renal threshold, or leak point of the kidney for sugar, is usually about 0.17 to 0.19 per cent. blood sugar, and variations are recognized to occur in diabetes mellitus. Most commonly any change consists in a raising of the threshold above 0.2 or even 0.3 per cent. blood sugar, with the result that urine tests for sugar give little indication of the satisfactory control of the disease, making the patient appear sugar-free when the blood sugar is high. Much more rarely diabetes has been reported to be complicated by a lowered renal threshold. One case each has been reported in the last two years by Voigt,[1] Shapland,[2] and by Curran and Mills,[3] their articles leaving the impression that the combination of diabetes mellitus and a lowered renal threshold is a very rare condition. Consequently the following eight cases seem worth recording, as the condition leads to confusion and difficulty in the practical management of the cases.

Diagnosis of the Condition.

This presents no difficulty when a case of diabetes is being followed by blood, as well as by urine, sugar tests. As the result of treatment it is found that, whereas the blood sugars are becoming normal, the urine does not become correspondingly sugar-free. Positive proof that the renal threshold is abnormally low can be obtained by simultaneous tests of the blood and urine for sugar on one or two occasions. For example, after insulin has been given at 8 a.m. the blood and urine sugar may be tested as follows:

Time:	10 a.m.	11 a.m.	12 noon.	1 p.m.
Blood sugar per cent. ...	0.19	0.12	0.085	0.080
Urine sugar	+++	++	trace	0

This proves that the threshold is below 0.12 per cent., but not so low as 0.08 per cent. The condition can often be proved quite definitely by estimating the blood sugar only once and testing the urine secreted afterwards. In the above example the leak point could be proved to be below 0.12 per cent. by finding sugar in the urine passed at noon after the bladder had been emptied at 11 a.m.

Description of Eight Cases.

An individual description of these eight cases seems unnecessary. All the patients had had typical symptoms of diabetes mellitus and in all an abnormally high blood sugar had been found, either on ordinary diet or after a glucose tolerance test. In three cases diet alone controlled the blood sugars; in five insulin was necessary. Five were males and three females, and their ages varied from 19 to 68. In two cases there was a family history of diabetes.

The son, aged 14, of one of these patients has no symptoms of diabetes, but on two occasions has shown an abnormally high blood sugar curve with slight delay in the return to normal. Unlike his father, this boy has a raised renal threshold and passed no sugar at a blood sugar concentration of 0.225 per cent.

The level of the renal threshold was fairly closely observed in these cases, and was respectively 0.15, 0.14, 0.11, 0.1, 0.1, 0.09, 0.09, and 0.08 per cent. It is obvious that the last few cases were hardly ever free from traces of sugar in the urine. The amount of glycosuria was in every case related to the level of the blood sugar, and the more the latter exceeded the threshold the more sugar appeared in the urine. This is contrary to what is usually stated to occur in renal glycosuria in non-diabetics, where

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the amount of glycosuria is said to be usually constant and independent of diet and the level of the blood sugar. This has not been true, however, in my experience of non-diabetic renal glycosuria.

In two of these diabetics the lowered threshold has remained constant for five years, and in none, observed over shorter periods, has it been found to vary. There is every reason to think, therefore, that the peculiarity is a permanent one, as renal glycosuria seems to be.

In addition to these eight cases, a lowered threshold appeared temporarily during pregnancy in two diabetic women, but became normal again after labour.

Practical Importance of the Condition.

These cases seem, on the whole, to follow the same course as diabetes with a normal renal threshold. They have not seemed more liable to ketosis than other cases, because they have not lost sufficient sugar in the urine to affect materially the ketogenic-antiketogenic ratio of the diet as fed. But one of the pregnant women, who was losing some 30 grams of sugar a day by the third month of pregnancy owing to the low threshold, excreted more ketone bodies than previously. The fasting blood sugar level might have been expected to be lower than usual from the loss of sugar, but this was not noticeable. However, two of the youngest patients, who had for years after the original discovery of their diabetes paid little attention to their condition, seemed to deteriorate much less rapidly than the usual careless juvenile diabetic. One of these patients gave little heed to diet for seven years, was thirsty, and had a blood sugar of nearly 0.3 per cent. when tested, and yet became rapidly controlled on diet without insulin, and has remained so since. Another, a girl of 12, had diabetes for seven years without any marked progression, and always responded at once to dietetic treatment. It seems possible that the low leak point acted in these cases as a safety valve, which tended, by the loss of sugar in the urine, to lower the blood sugar and relieve the strain on the islet cells. This is my impression in these two cases, but, of course, they may have been exceptionally unprogressive for other reasons.

It would appear that these cases respond to treatment in the usual way, but they certainly present some difficulty in their management. It is impossible to keep the urine sugar-free if the threshold is below 0.1 per cent. The usual urine sugar tests give little or no indication of the patient's real condition, which can be known by blood sugar tests alone, difficult to carry out frequently, and sometimes impossible. It is very disappointing to the patient, and the practitioner, to find sugar almost constantly present in spite of treatment, and the patient, at least, is apt to be depressed. It is best for these patients not to be taught to test their urine or to co-operate as much as usual in their treatment. If the threshold is lowered to only 0.14 per cent. or so, this may be almost an advantage in treatment, as one may then be certain, if the urine is sugar-free, that the blood sugar is normal.

It is difficult to see any etiological connexion between the lowered threshold and diabetes in these cases. It is highly improbable that the diabetes produces in some way a lowering of the threshold, for any change that is known to take place in diabetes is in the direction of a rise in the threshold; nor is there any clear evidence that a pre-existing condition of renal glycosuria may tend to produce or be followed by true diabetes. Indeed, Hjärne[4] has recently published a hereditary study of renal glycosuria which tends to show the absence of any connexion between diabetes mellitus and renal glycosuria.

The most likely explanation of these cases is the fortuitous development of true diabetes in cases of renal glycosuria. It is now well known that a lowered threshold is fairly common in normal individuals, though what percentage of the population are renal glycosurics it is impossible even to guess; but the number of cases of renal glycosuria that are discovered must be very small compared to the number existing. The above eight cases have occurred among some 500 diabetics—an incidence of 1.6 per cent., not a high one, probably no higher than in the non-diabetic population. Quite likely among my 500 diabetic cases others with a lowered threshold have escaped discovery, because it requires close observation and not infrequent blood sugar tests (not possible in every case) to establish the condition. There seems no reason to think that the combination of diabetes mellitus with a lowered renal threshold is not a mere coincidence.

REFERENCES.

[1] Voigt, C.: *Lancet*, 1927, ii, 916. [2] Shapland, C. D.: *Lancet*, 1927, i, 758. [3] Curran, J. A., and Mills, C. A.: *Journ. Lab. and Clin. Med.*, 1928, 13, 646. [4] Hjärne, U.: *Acta Medica Scandinavica*, 1927, 67, 422.

VOMITING IN INFANCY.

BY

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VOMITING is a very common presenting symptom during the first few months of life, and one about which the mother is not unnaturally anxious, as it signifies to her that her child is not getting sufficient nourishment.

In the act of vomiting the walls of the stomach contract, the diaphragm is pushed downwards in the full expiratory position, while powerful contractions of the abdominal muscles take place; at the same time the cardiac sphincter is relaxed and the gastric contents are expelled, chiefly as the result of the pressure exerted in the abdomen by the diaphragm and the abdominal muscles, aided to some extent by reversed peristalsis. As a general rule the pyloric sphincter is closed, but in some cases it may become relaxed, with the result that bile and intestinal contents are expelled with the vomit. The simplest method of bringing this mechanism into play is to overfill the stomach, especially if this is done rapidly before the walls of the stomach have time to adapt themselves to the sudden increase of gastric contents. Thus it is extremely common for breast-fed babies to vomit a small amount at the end of their feeds. Provided the gain in weight is within normal limits no treatment is required, and the symptoms may be regarded as one of Nature's "safety valves." If, however, it is found that the baby is gaining weight excessively, a little water should be given beforehand and the actual length of time spent over each feed decreased.

Vomiting from Birth.

All cases in which such a history is given should be regarded seriously, as a congenital obstruction of the duodenum is a possible cause. It is also important to realize that the symptoms of congenital pyloric obstruction may date from birth. As a general rule the vomit in the former is bile-stained, and jaundice may occur, but the distinction between the two conditions is really only of academic interest, as surgical intervention is indicated in both.

Various congenital malformations of the oesophagus that produce intractable regurgitation of food dating from birth are occasionally encountered. Some form of fusion of trachea and oesophagus is the most common deformity, and screening with the *x* rays may sometimes show conclusive evidence of obstruction. Treatment is of no avail.

Vomiting with an Acute Onset.

The sudden onset of vomiting, associated with diarrhoea, in an apparently healthy baby suggests immediately the possibility of an infection, of which the most likely site is the gastro-intestinal tract, particularly in artificially fed children. It is important, however, to realize that parenteral infections may produce exactly similar symptoms; the most common of these are pyelitis, bronchitis, and otitis media. Recent work, both in this country and in America, has drawn attention to the great frequency of acute pyelitis in babies, and unless the urine is examined the condition is frequently missed. In severe cases the onset is sudden, with marked fever, vomiting, diarrhoea, and convulsions or rigors; the latter are uncommon in children, and should always suggest an acute kidney infection. Other cases have a more insidious onset, with vomiting and persistent loss of weight as the outstanding features. It is essential in

any suspicious case to obtain a specimen of urine, which may be done most easily by placing the child on a mackintosh sheet and securing the urine that collects at the most dependent part. If the case is one of pyelitis the urine will be definitely turbid, and will show pus cells and motile bacilli under the microscope. The vast majority of such cases are due to infection with *B. coli*, and the essential part of the treatment is to administer large doses of alkali; 10 grains of potassium citrate and of sodium bicarbonate can be given with safety every three hours to a child of 6 months. The best criterion of the progress of the treatment is the reaction of the urine, and it is advisable to provide the mother with litmus paper and instructions to continue giving the medicine at frequent intervals till the urine is alkaline.

Acute infections of the middle ear are very common in children of all ages, and here again the usual presenting symptoms are screaming, vomiting, and sometimes diarrhoea; unless the drums are inspected in any suspicious case the first indication of local trouble will be the presence of a discharge.

Naturally the gastro-intestinal tract will require treatment irrespective as to whether it is the primary site of infection or not. A preliminary dose of castor oil—a drachm for a baby of 6 months—is advisable when the case is seen early, but is actually harmful in the later stages. A period of starvation of about eight to twelve hours' duration should follow, during which saline is given freely. If vomiting is marked a preliminary stomach wash is indicated, and later, food in small quantities. Boiled breast milk is ideal, but in its absence a half-strength dried milk mixture with a low sugar and fat content may be used.

The vomiting of acute intussusception is nearly always characteristic and the clinical picture of the condition distinctive. Emphasis should perhaps be laid on the suddenness of the onset and the periodicity of the pain; thus the mother may describe exactly the time of onset, and the baby itself will usually lie quite quiet between the attacks of pain and screaming. A rectal examination is especially important in diagnosing an early case, as the presence of blood may be detected in this way some time before it becomes visible on the napkin.

Vomiting with a Chronic Onset.

Very frequently the mother will complain that vomiting occurs shortly after each breast feed and is accompanied by prolonged screaming, the latter being especially marked at night. Such a history suggests a diagnosis of underfeeding. In breast-fed babies, whenever the question of the quantity of food is in doubt, test feeds are called for. These can be carried out with great ease in any intelligent household provided fairly accurate scales are available, and the determination of the weights before and after every feed during twenty-four hours eliminates the need for calculations. Only on this principle is it possible to treat feeding difficulties with any measure of success; any other way involves guesswork. As a simple working rule it should be remembered that a child requires about 2½ ounces of breast milk per pound body weight per day, and if test feeds are carried out it is a simple matter to adapt the diet accordingly.

Vomiting *per se* may indicate overfeeding or underfeeding; in the former case it is due to the rejection of surplus food by an overfilled stomach, and in the latter to the regurgitation of air swallowed to compensate for the inadequate quantity of milk. The weight chart is naturally of great help in such cases, and test feeds will decide the extent of the discrepancy.

Congenital Pyloric Stenosis.

Vomiting is undoubtedly the predominant symptom of this condition, and in many cases the details provided by the mother make the diagnosis almost a certainty. The symptoms usually start at about the third week of life, and become progressively more severe and more characteristic. The child snatches at the breast or bottle for a few minutes and then vomits very forcibly, so that the food is ejected well beyond the cot. The motions are small and hard, and the child loses weight steadily. In making a diagnosis it is absolutely essential to watch the child being fed, as gastric peristalsis can be seen in an early case only during an attack of vomiting. The detection of the tumour is largely a matter of patience; it is important that the abdominal wall should be well relaxed, and this condition is most easily secured when the child is asleep; in difficult cases the examining fingers should be worked up under the liver margin as the tumour may be quite high up in the abdomen.

It is now generally agreed that Rammstedt's operation is the correct treatment for this condition, but before it is actually undertaken attention should be paid to the following points, upon which depends very largely the success or otherwise of the operation.

1. Re-establishment of breast-feeding. Very frequently the persistent vomiting and loss of weight have been taken as indications that breast milk does not "agree" with the baby, and by the time the child is seen weaning may have occurred and perhaps two or three artificial foods tried without success. In many cases it is possible partially to re-establish breast secretion, and this should be done by putting the child to the breast regularly, and by breast massage. It will usually be necessary to give some artificial food in addition, but this should only be done after the baby has been put to the breast. Even small quantities of breast milk are invaluable for the feeds immediately following an operation.

2. Daily stomach washes should be instituted as soon as the diagnosis has been made, and it is surprising how much improvement may be brought about in the clinical condition of the baby in two or three days. A solution of sodium bicarbonate (a teaspoonful to the pint) should be used and the procedure carried out about two hours after a feed; incidentally the amount of residue is a measure of the degree of stenosis and of the urgency for operation.

3. Subcutaneous saline should always be given immediately before operation, and, if the baby is at all wasted, it should be started as soon as the diagnosis is made and given regularly twice a day for two or three days.

From the above considerations it can be seen that it is advisable in the majority of cases to wait three or four days before undertaking operation so as to improve the general condition of the baby by medical means.

Habitual Vomiting.

From time to time cases are seen in which no dietetic error or organic disease can be found to account for the persistent vomiting that occurs usually just after a meal. There is frequently a neuropathic family history in such cases, and the baby itself is very restless, and cries at the least noise or distraction. It should be noted that some degree of peristalsis may be seen in these patients, although no pyloric tumour is palpable, and the progress of the condition will negative the latter diagnosis. By far the best treatment for such a condition is to thicken the feed with flour or fine oatmeal. In an ordinary case about half an ounce of flour may be added to a pint of milk mixture and the whole brought to the boil and allowed to simmer for ten minutes. The resultant mixture will be a thin gruel that will flow through a large hole in a teat. In pronounced cases that do not respond to this treatment it is necessary to use a thick cereal food that has the consistency of treacle. Such a food may be made by allowing about 2 ounces of flour to each pint of milk and boiling the mixture gently for at least half an hour. From 2 to 4 ounces may be given at each feed, though naturally it will be necessary to supply the requisite amount of fluid by giving drinks of water between the feeds.

Some help may be obtained in cases of habitual vomiting by the use of a chin strap applied immediately after a feed, and from the administration of small doses of atropine and bromide. A convenient mixture is:

Solution of atropine sulphate (1 in 1,000) ...	2 minims
Sodium bromide	1 grain
Chloroform water ... ... to	1 drachm

This should be given about half an hour before the feeds. As a general rule, however, it will be found that adequate thickening of the feeds is the essential part of the treatment, and the rapid improvement that ensues in the condition of the child is the surest proof of this.

THE OXIDASE REACTION IN THE LABORATORY DIAGNOSIS OF GONORRHOEA.

BY

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THE oxidase reaction is due to the presence of oxidizing ferments in certain organisms, and is characterized by a colour reaction produced when a reagent, such as dimethyl-para-phenylene-diamine hydrochloride, is poured on to the colonies of these organisms. The reaction is not specific for any organism, but is given, amongst others, by *B. anthracis*, *B. pyocyaneus*, *B. subtilis*, *B. cholerae*, and the Neisserian group.

Dietrich and Liebermeister[1] in 1902, whilst studying the detailed structure of the anthrax bacillus, made use of the oxidizing ferments present. In 1910 Schultze published a paper[2] on methods of observing oxidation and reduction in bacteria, and noted the organisms giving rise to this oxidase reaction. Kramer[3] in 1912 confirmed this work. Little further progress was made until 1928, when Gordon and McLeod published a paper[4] confirming most of Schultze's work, but they modified the latter's method so that it could be used as a means of differential diagnosis in mixed cultures and not be limited to pure subcultures. Their method was used throughout the present investigation, and consists in pouring on to the colonies of the organisms either phenylene-diamine hydrochloride or dimethyl-para-phenylene-diamine hydrochloride. Those colonies containing the oxidizing ferments present a colour change, whilst those that do not, remain unaffected.

The objective of the present investigation was to ascertain the value of this method in the routine examination for the presence of the gonococcus in cultures taken from the genital tract of patients who, clinically, had, or were suspected of having, gonorrhoea. The inoculation was made on to a modification of Thomson's medium (*p*H 7.5), as it became evident that the colour change shows up much more readily on this transparent medium than on the opaque brownish-red surface of blood agar. The test was applied after forty-eight hours' incubation at 37° C., the reagent used being a 1 per cent. solution of dimethyl-para-phenylene-diamine hydrochloride (supplied by the British Drug Houses) in distilled water. The solution should not be over seven days old, since with older solutions the colour reaction is less well defined.

The colonies were first examined with a ×6 hand lens, and samples of any having the appearance of being gonococci were picked off, stained by Jensen's modification of Gram's stain, and examined microscopically. If the organisms had the morphological appearances of gonococci this was noted. The surface of the medium was very gently washed with about 0.5 c.cm. of the reagent, thus avoiding contamination of colonies of gonococci by other organisms from other colonies. This is important when pure subcultures are required for vaccines, etc. The cultures were then observed by the naked eye and with a ×6 lens at intervals of 1, 3, 5, 10, 15, 20, and 30 minutes, and any colour change in a colony carefully noted. The results were recorded as positive, "pseudo," and negative reactions.

A positive reaction is shown by the development, almost immediately, of a very faint fine pink, which at this stage is only to be seen with the aid of a ×6 lens. In three minutes this deepens to a cerise shade, and the colonies are easily seen by the naked eye amongst those which are unaffected. Gradually the colour changes to red and then to reddish purple, finally ending, in about thirty minutes, in an intense jet black. This may be regarded as a normal reaction, but variations in the speed of the reaction do occur. They appear to depend on the age of the culture and the reagent; the older these are, the quicker, but less well defined, the reaction, whilst, within limits, the converse holds good.

The term "pseudo-reaction" was applied to a change of colour which was distinguishable from that seen in the truly positive reaction by being brownish pink rather than pure pink, and becoming in the end brownish black instead of jet black. It was afforded by some non-gonococcal colonies. A negative reaction indicates no change in a colony.

Two thousand cultures were examined, the first 250 of which were selected as a "trial run." These contained obvious gonococci colonies, doubtful gonococci colonies, and cultures obviously not containing any gonococci. The following 1,750 were routine cultures sent into the laboratory for examination. Of these 1,750 cultures there were 117 (6.7 per cent.) positive reactions, and all of these were morphologically gonococci. Many of these organisms were cultured and gave the typical glucose fermentation, other sugars, such as maltose, saccharose, levulose, etc., being unaffected. They were also soluble in caustic soda.

Other members of the Neisserian group also gave positive reactions, but the only one likely to confuse the issue in a case of doubtful gonorrhoea is the *M. catarrhalis*, and most authorities[5] are agreed that its presence in the genital tract is rare. The intensity and celerity of the reaction given by a few of the members of this group appear to depend on their ability to ferment the sugars. Thus, *M. catarrhalis* gives an extremely quick and vivid colour reaction, whilst *M. flavus* (Type 1 only tested) gives a slow response. Between these two extremes comes the gonococcus.

The "pseudo"-reactions (2.2 per cent.) were almost invariably given by one of the protean varieties of coliform bacilli. Gordon and McLeod report negative reactions with *B. coli*, whilst Schultze and Kramer found that it gave a definite response. From this investigation it would appear that some varieties of coliform bacilli give an oxidase reaction, but that the great majority remain unaffected. *B. subtilis*, when present, always gave a response, and in two instances this was noted with a variety of streptothrix.

Amongst the mixed cultures which gave negative oxidase reactions (91.1 per cent.) the gonococcus was not encountered, but on four occasions a very small Gram-negative coccus was noted, which it was possible to isolate in a pure culture on only one occasion, and then with great difficulty. It had the following characteristics: (1) Gram-negative, about one-quarter the size of the gonococcus, not arranged in pairs, and giving a negative oxidase reaction; (2) ferments glucose, lactose, maltose, and mannite with the production of acid but no gas; (3) no action on inulin or dulcite; (4) clots milk; (5) very poor growth on agar, but somewhat better on hydrocele agar, producing pin-point colonies, which were dull and sticky and required frequent subculture (every two or three days) in order to keep the strain alive. This organism appears to belong to the Neisserian group in spite of its negative oxidase reaction.

From these results it is evident that this method of diagnosis of the presence of gonococci colonies in a culture tube tends to increase accuracy, particularly in cultures where the colonies of gonococci have grown feebly or have been almost smothered by the growth of such secondary organisms as *B. coli* or staphylococci. A *definite* positive reaction removes the necessity of staining, whilst colonies giving doubtful results can always be stained and subcultured provided this is done prior to the colony assuming a blackish hue. When this occurs it is an indication that the organisms have been killed. Pseudo-reactions practically never give rise to any doubt except in cases where the reagent is not fresh or the cultures have been incubated for more than forty-eight hours. The strepto-pneumococcal colonies, which are so frequently a cause of anxiety owing to the similarity of their appearance to those of the gonococcus, never give a positive reaction, hence this potential error is removed. Finally, where large numbers of cultures are examined by this method there is a great saving of time and labour.

I would like to express my thanks to Dr. T. E. Osmond, pathologist to the venereal disease department, St. Thomas's Hospital, for his kind advice and assistance in the preparation of this paper, and also to Colonel L. W. Harrison, D.S.O., for permission to publish the same.

REFERENCES.

[1] Dietrich and Liebermeister: *Centralbl. f. Bakt.*, Orig., 1902, xxxii, 858. [2] Schultze: Ibid., 1910, lvi, 544. [3] Kramer: Ibid., 1912, lxii, 394. [4] McLeod and Gordon: *Journ. Path. and Bact.*, vol. xxxi, No. 2, 185. [5] Pelouze: *Gonococcal Urethritis in the Male*, p. 40. Morton: *Genito-Urinary Diseases and Syphilis*, p. 128.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

EPITHELIOMA OF THE SKIN IN A FEMALE COTTON OPERATIVE.

THE undermentioned case is considered worthy of record in view of the interest manifested in occupational carcinoma.

The patient, aged 66 years, was first seen in February, 1928, complaining of a growth on the right forearm which had been present about twelve months. She was of poor general condition and wasted musculature; general senile changes were present in all systems. A careful examination of the skin as a whole showed a mild xeroderma, but not of more marked degree than is often found in elderly persons of thin build. There was a pronounced diminution of subcutaneous fat, and considerable loss of elasticity. On lifting the skin between the forefinger and thumb there was a "tissue paper" wrinkling, such as is seen in a syphilitic scar—to the touch the skin imparted a sensation of dry parchment. Over the surface of the entire body, and to a far greater extent over the skin of the arms and neck, there were a number of islands of pigmentation, varying in depth of tint from a light brown to black. The size of these areas was equally variable, some patches being as much as half an inch across and others only pin-point. The changes described, however, were almost entirely confined to the lower two-thirds of the arm, the face, and the neck, although similar changes were to be seen in a very mild degree elsewhere on the body. Exposure of the skin, from lack of protection of clothing, appeared to have increased the tendency of the skin to these changes.

In addition to the areas of altered pigmentation there were multiple points of pigmented follicular hyperkeratosis and verrucae. Most of these were elevated above the skin to a conical formation 1/8 to 1/4 inch in depth and diameter. On the right forearm in its middle third a warty squamous-celled carcinoma was present; around this was considerable infiltration, due in part to secondary infection of the central lesion. There was no involvement of lymphatic glands, and excision of the growth and about an inch of surrounding skin gave an uninterrupted recovery. Examined later there was no sign of recurrence. Microscopical examination of the growth confirmed the diagnosis of epithelioma. The woman had been employed throughout the greater part of her working life in a carding-room of a cotton mill, and as such had been exposed to the effect of various mineral oils.

The condition is of interest in the possible association of the lesions with occupation. Similar skin lesions have been found in persons who have never been exposed to irritant oils, and it should perhaps be regarded as *post hoc* rather than *propter hoc*. A baker who develops eczema is not necessarily suffering from "bakers' itch."

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IDIOSYNCRASY TO QUININE INJECTIONS.

DR. CRUIKSHANK'S memorandum (January 19th, p. 104) is an almost exact description of an experience of mine.

Mrs. X, aged 58, was referred to me by Dr. Whittington, honorary physician to Hove Hospital, suffering from varicose veins in both legs and with an eczematous spot below the left internal malleolus and a small painful ulcer. I injected 1 c.cm. of Douthwaite's quinine-urethane solution into a vein in the left leg, and after applying a small compress assisted her down without any difficulty from the chair on which she was standing. A few minutes later, while seated and putting on her stocking, she suddenly complained of a hot stifling sensation in her throat and a headache, and turned deathly white. I gave her some brandy and put her head down between her knees, but she became cyanosed, quite pulseless, pupils widely dilated, bladder sphincter relaxed, and she had a "rattle" in her throat. She was at once laid on the floor while camphor was administered subcutaneously and oxygen given. In a few minutes she regained consciousness and vomited, but her pulse still remained imperceptible at the wrist and no heart sounds could be heard with the stethoscope and her pupils were still dilated. She was placed on a couch and covered with blankets, given a drink of hot tea, and hot-water bottles were placed near her. She complained of feeling cold, having a splitting headache, and a sense of constriction in her throat. These symptoms gradually wore off, and in a couple of hours she was sufficiently recovered to be taken home by her daughter. Consciousness was only lost for a very short period, and the patient related to me minutely all that we had done from the moment she was laid on the floor. In a few days she was none the worse for her adventure, and her eczema and ulcer had almost disappeared.

I have twice before seen a similar occurrence; the first time was when a woman fell dead on my shoulder in an omnibus (the *post-mortem* examination showed atheroma of the coronary artery), and the second was when a patient of mine had an attack of angina pectoris in my presence and I thought he was dead, but camphor and oxygen were handy and he pulled round.

Mrs. X has a negative Wassermann reaction and a blood pressure of 150 (systolic); heart and lungs normal. On reading Dr. Cruikshank's memorandum I wrote a post-card inviting her to come to the out-patient department, and Dr. Whittington and I performed the dermal test as suggested, using my own forearm as a control. She showed a marked wheal surrounded by a zone of erythema, but only slight redness at the site of the distilled water control. On my own forearm no reaction was obtained to quinine.

This is the only case out of over a hundred treated by me with quinine injections in which alarming symptoms have occurred. However, I shall in future apply this very simple dermal test to all newcomers who cannot assure me of their ability to take quinine without ill effects, and I should advise others to do the same.

Hove. ST. GEORGE B. DELISLE GRAY.

THE TRANSMISSIBILITY OF PYORRHOEA ALVEOLARIS.

PYORRHOEA alveolaris is a complaint so widespread in its incidence and so destructive in its consequences that the investigation of its etiology is called for.

It is commonly stated that the condition originates in an accumulation of decomposing foodstuffs in the interstices of teeth, bacterial invasion and putrefaction of the debris being the starting point of a gingivitis which leads to periodontal inflammation. There is no doubt that inattention to dental hygiene and the consumption of soft foodstuffs, particularly confectionery, are frequently found among patients who bear evidence of this disease.

Observation of its onset among patients met in the ordinary run of general practice leads one to the conclusion that there are other predisposing factors which are equally if not more important; among these may be mentioned the following:

1. *Debilitating conditions.* After an attack of influenza it is common to note that the gums are spongy, while the patient complains that they bleed easily on being brushed. The condition may clear up entirely when the patient is restored to health.

2. *Alteration in the salivary reaction.* This occurs in general diseases, such as Addison's anaemia; in mouth breathers, particularly those who have suffered from long-standing nasal obstruction; and in heavy smokers where an excess of alkaline saliva constantly bathes the teeth.

3. *Direct infection.* This is probably more frequent than has been generally realized. Attention was drawn to the possibility of pyorrhoea being a contagious complaint by the following sequence of events.

A man, aged 35, with well-marked pyorrhoea affecting the lower incisors (the common site of invasion), was married to a young woman whose mouth was perfectly clean and the gums coralline. Two months after marriage the wife came for treatment of headache, and upon routine examination it was found that the gums were of a dull purplish hue and spongy in consistence. In spite of careful hygienic measures the condition spread until the majority of the teeth in the lower jaw became loosened and easily movable. The condition only showed signs of improvement when circumstances led her to visit her mother for a period of six weeks; upon her return to her home the gums were of firmer consistence, pink in colour, and no longer exuded pus on pressure. Since then her husband has had his offending teeth extracted and the wife's cure persists.

Taking heed from this object lesson, many cases have been watched, and in a considerable proportion it has been noted that the onset of pyorrhoea in young persons has dated from their first love affair. It has long been traditional that women lose teeth in every pregnancy, ascribed to the abstraction of calcium salts for the benefit of the uterine parasite. In the country these women are commonly sufferers from pyorrhoea, and it would appear to be reasonable to investigate the condition of their husbands' mouths before embarking upon treatment. It is an axiom that sweeping assertions should not be based upon evidence derived from a few cases in one man's practice, but it would appear that the possibility of transmission of pyorrhoea by direct contact might well be worked out by experts more fully equipped for dental research.

Sherborne. JOHN WHITTINGDALE, M.B., F.R.C.S.

METASTASES IN MAMMARY CARCINOMA.

THE unusual distribution of metastases in the following case seems to make it worthy of record.

A married woman, aged 39, consulted me in February about a nodule she had noticed in the upper and outer quadrant of her right breast. This was about the size of a walnut, apparently freely movable, and without any enlargement of the axillary glands on that side. A simple tumour was diagnosed, and I removed it with a good deal of the surrounding tissue.

Dr. W. H. Grace, pathologist to the Chester Royal Infirmary, reported on the specimen as follows: "This tissue shows the histological characteristics of a scirrhous carcinoma of the breast. There is a good deal of fibrous tissue, and a small amount of inflammatory reaction. The neoplastic process seems to be growing fairly rapidly."

The patient was then sent to the David Lewis Northern Hospital, Liverpool, where a radical operation was performed; from this she made a good recovery. She came to me again in September with what seemed to be an acute septic condition at the nail fold of the left middle finger. The nail was removed and the finger incised. One or two sloughs separated in a few days, but the purulent discharge continued for an unusually long time, and there seemed to be a very excessive amount of granulation tissue. When she returned from a short holiday at the end of October the tip of the finger was so large that a general anaesthetic was administered and the finger-tip reduced to a more normal size by cutting away most of the "granulations."

Dr. Grace's report on these was as follows: "This is undoubtedly a secondary deposit of a carcinoma. The cells are arranged in such a way that it could be a reproduction of a carcinoma of the breast; the cells are taking up a certain amount of alveolar formation."

At this time there was no sign of any recurrence in the breast, axilla, or anywhere else. A few days later, however, she complained of severe headache round about what looked like a suppurating wen in the right parietal region. This turned out to be a hard, solid, and not very vascular mass, moving freely with the scalp, and certainly not a wen. Since then she has had almost continuous headache, with intermittent attacks of vomiting. On ordinary clinical examination neither the thorax nor the abdomen shows any abnormality, and there is no alteration in the reflexes.

Crewe. F. T. INGRAM, M.D.

Reports of Societies.

STARVATION IN TREATMENT.

AT a meeting of the Medical Society of London on January 28th, with Dr. J. WALTER CARR, the president, in the chair, a discussion was held on "Starvation in treatment."

Dr. E. I. SPRIGGS opened by remarking that starvation was the common fate of a large number of living organisms; the human race in the course of ages had acquired a marvellous power of meeting this risk by the preparation, storage, and transportation of food. Fifteen years ago one might have been justified in thinking that starvation on a community scale was by way of being banished from human experience; since then there had been seen a gigantic experiment involving the partial starvation of millions of people. Experiments of this kind had been made many times before, but never on such dimensions, and not at all since nutrition had been placed on a scientific basis. In normal times, however, the ordinary man stood in much more danger of overfeeding than of underfeeding; therefore the withdrawal of the whole or part of the food was a rational and useful measure in many diseases. Starvation might be complete or partial; in the former case the predominant symptom was hunger, which was not quite the same thing as appetite. Indeed, probably most persons in an ordinary company had never at any time in their lives felt what hunger was. Discomfort arose in the neighbourhood of the epigastrium, which was insistent but intermittent, beginning, not at the moment when the stomach was empty, but some time afterwards. The modern view was that hunger pain was due to stomach contraction. The physiological data of starvation experiments had been worked out upon a number of people. It must be understood that when food was withheld the body did not starve; it went on feeding as long as it lived, but on its stores instead of on ingested material. The weight diminished rapidly at first, and then settled down to a loss of about one pound a day. If a man living a sedentary life, and expending 2,400 calories a day, cut off his food, his body endeavoured to bring down the expenditure to about 1,800 calories. The body exercised a great power of internal economy when fasting. The end came when mobilization failed, when the body stores were not supplied sufficiently to some important organ, though fat might still remain in the body. During fasting the blood pressure fell steadily as a rule. In some Continental observations on prisoners of war who were hunger-striking it was stated that the blood pressure in one case dropped as low as 55 systolic. The temperature did not drop during fasting, or dropped very little. The mental state in a moderate fast was not, so far as could be ascertained, affected, but if fasting was prolonged curious mental states might develop. The loss of weight, apart from the fat, fell first of all on the glands. The liver, spleen, and pancreas lost more than any parts of the body, the muscles came next, and the heart and brain last. When food was stopped the first call was upon the glycogen of the liver, and after this upon the more mobile stores of protein; next on the so-called deposit protein; and last on the tissue protein. The fat was, of course, the main source of energy during fasting; owing to the large amount of fat being burned its metabolism was liable to be incomplete, with the production of acidosis. The benefit which fasting had been found to confer on epileptics was ascribed to the acidosis produced, which combated the alkalosis associated with that condition. The blood sugar remained constant until death was approaching; no doubt the sugar was derived from protein and probably fat. There was a general idea that fasting cleared the blood; in fact the nitrogen content of the blood altered very little, and any change was in the direction of concentration. There was nearly always more uric acid in the blood of the fasting person; the calcium was also rather increased. The blood in fasting was like a highway filled with traffic on an emergency mobilization; it was not purified in fasting, but rather the reverse; the organs that were purified were the glandular organs. As regards the secretions, that of hydrochloric acid generally ceased; milk secretion went on for a few days and then stopped. Fasting had no known specific effect on the healthy body except to call into being its whole resistance against the risk of approaching death. Turning again to the war experiment, Dr. Spriggs said that it had confirmed the scientific work of the previous generation as to body needs. The stress on the population in many parts of Germany was very severe; it was said that there was not a poor man in Berlin who weighed more than 8 stone. The restricted diet resulted at first in an improvement of health, but nervous symptoms presently appeared, and afterwards anaemia, myxoedema, and digestive diseases were widely current. Coming to the employment of starvation in disease, the speaker said that complete starvation had been used for local disease of the alimentary canal; in acute diseases such as appendicitis it was a temporary measure. It was not advisable to continue complete starvation for any long time; men might survive it and say they felt better, but it was a feat of endurance and nothing more. Short complete fasts had proved beneficial—no food, but plenty of water or other fluid—for one, two, or three days. Growths were benefited, particularly those of the muscles and connective tissue; a great many skin diseases also responded to fasting, and rheumatic conditions were reported as benefited. In acute nephritis and other acute illnesses it was a common thing to cut off food. Dr. Spriggs then related experiences with his own patients in obesity, and recounted consistent results. Diminution of food was the one certain means of treating this condition; those other physical treatments to which patients attached so much importance, such as massage and baths, did nothing to diminish weight. The method he employed was to give a measured mixed diet containing sufficient protein for the bodily needs. He exhibited dietary tables for successive days, each day with four meals and a plentiful variety of food at each, but designed with due regard to the individual case so as to diminish gradually the calorie value by about 100 calories a day. If hunger was felt the patient might be given a portion of cold lean meat and nothing else, or,

better still, a cup of bovril. The object of the method was to enable the patient to continue treatment, with the aid of his doctor, after the course was over, without risk. One-food cures were less desirable, for they could only be borne for a time, the patient then returning to his old habits. The value of reduced diets in plethora and diabetes was described. He concluded with some remarks about the cults of fasting, pointing out that all methods of treatment which did good were liable to abuse. He gave particulars of a trial at Göttingen in which a doctor was indicted for causing the death of a patient by negligence. The patient had been put on a fasting cure, and given only lemon squash and a teaspoonful daily of a vitamin preparation for six weeks. The defence was a curious document, in which death was ascribed, not to lack of food, but to persistence in hot baths against the doctor's advice. The court found the doctor guilty of submitting a healthy, or nearly healthy, man to a dangerous treatment, and fined him 300 gold marks, with the alternative of a month's imprisonment.

Dr. F. PARKES WEBER said that voluntary intermittent fasting was simply a return to the involuntary habits which dominated the lives of our primitive ancestors. Nature still to-day retained her own ascendancy by withdrawing the desire for food in most acute diseases or when, as the result of overfeeding, the digestive mechanism had been upset. An important aspect of therapeutic fasting was the use of intermittent absolute or relative fasts for ailments such as gout, diabetes mellitus, some forms of obesity, and some diseases and disorders of the digestive organs, including appendicitis. In some persons a limited diet had the effect of increasing the resistance against colds in the head or sore throats. He recalled how, as far back as 1909, he treated a case of diabetes mellitus by the temporary limitation of intake to water and olive oil for a short time, and the patient was rendered temporarily free from sugar. One noteworthy non-medical writer on the subject was Mark Twain, whose amusing skit on the "appetite cure" was meant to show how large a part a limitation in diet played in the treatment of ailments for which the fashionable world flocked to the healing springs. Mark Twain said that no cold in the head could survive twenty-four hours' unmodified starvation.

Dr. ANTHONY FEILING described a recent case where a fever terminated dramatically as a result of starvation diet. The man had been feverish, with a temperature of 103° in the evening, for a week before he came into hospital; it appeared to be a case of mild typhoid or paratyphoid infection. After some time he was put on complete starvation (except for water), and this was kept up for three days; then he was put on a diet of sour milk, one pint a day for a week. His temperature went down suddenly, showed no tendency again to rise, and he left the hospital perfectly well.

Dr. GRAHAM LITTLE spoke of the use of starvation in skin diseases, where sometimes the most amazing results were seen. A friend of his, a New York dermatologist, who himself suffered from a severe skin eruption, was able to control it by confining his diet for the time to rice, bread-and-butter, and water; he was able to live on that diet quite comfortably for a week or more without appreciably losing weight. Much more effective was what was known as the Welper method, which the speaker had used in his practice for eight years; this was a combination of fasting and purging. The patient was made to fast for thirty-six hours, having no food except perhaps orange juice, and was given a large dose of some aperient. He mentioned one distressing case of acute lichen planus, for which he prescribed two days' fasting, with a purge on the first day; the whole eruption vanished within a week. For securing a very rapid amelioration of symptoms where the cause could be traced to a bowel accumulation this was a very useful method.

Dr. H. A. DES VOEUX mentioned two kinds of cases in which he had been accustomed to use starvation treatment. One was in illness resulting from overfeeding in children of the well-to-do, and the other was in acute illness like acute pneumonia. He had put his pneumonia cases on water for the last twenty or twenty-five years, and there was nothing for which he received more gratitude from them for excluding that continual fussy "nourishment" at short intervals.

Dr. A. P. CAWADIAS thought it important to distinguish between the therapeutic period in a fast—a period lasting perhaps four or five days—and the subsequent toxic period, where the equilibrium of the individual had become imperfect, and any infection might bring about catastrophe. From the clinical point of view it was very important to terminate the regime before the toxic period began.

Dr. GEORGE GRAHAM suggested that the miserable feeling noted in starvation patients after a certain time was due to insufficient carbohydrates.

Dr. SPRIGGS, in reply, agreed with Dr. des Voeux on the treatment of acute pneumonia, though his own practice had been to give, not water, but fruit juice, a vehicle for the introduction of glucose, which was extremely useful to such people. In his original remarks he had spoken rather slightingly of single-food cures, but occasional days on one food were beneficial, and were used by him. A day on which nothing was taken but six Jaffa oranges, furnishing about 350 calories, might be a very good thing; also a milk day. He agreed with Dr. Graham that in cases of difficulty in starvation it was well to increase the carbohydrates; he had found it useful to give a meal of buttered toast to people complaining of headaches. On the whole subject, he thought it might be said that fasting was of great value in many conditions, but should always be undertaken under medical supervision.

CRIMINAL ABORTION AND THE SALE OF ABORTIFACIENT DRUGS.

A DEBATE on the question of criminal abortion and the measures necessary to restrict the sale of abortifacient drugs took place at a combined meeting of the Medico-Legal Society and the Child Welfare Group of the Society of Medical Officers of Health on January 23rd, with Sir WILLIAM WILLCOX in the chair.

Dr. F. J. MCCANN, in opening, said that abortion was undoubtedly increasing in this country. From so-called natural causes it was not uncommon—some gave the proportion of one in five or six full-time pregnancies—but it was probably not an overestimate to say that of the total number of abortions 25 per cent. were criminal. The figures, however, varied with locality. Another point to bear in mind was that some women aborted very easily, while others could be subjected to great violence, internally and externally, without abortion. Dr. McCann showed some anatomical sketches to illustrate the structures concerned, and indicated how serious might be the consequences of the passage of an instrument—sometimes even in skilled hands. It was remarkable how many kinds of instruments were used in abortion cases—skewers, button-hooks, pieces of twig, hairpins, bodkins, had been passed along the vagina. The question arose whether a woman could successfully procure abortion on herself. The answer was in the affirmative, though some women who said they had done it themselves were hiding the real culprit. The one thing that haunted the abortionist, skilled or unskilled, was shock, which could neither be foretold nor prevented. Some women suffered a great amount of shock when any interference took place, the reason being, he thought, that they went to the abortionist with their nerves already strung up to concert pitch, knowing themselves about to take a grave, possibly a fatal, risk. The character of the patient also led to the undoing of many abortionists. The patients as a rule were wilful and disobedient, and refused to stay in bed lest suspicion be aroused, although rest in bed was more necessary after an abortion artificially induced than after abortion from so-called natural causes. Dr. McCann then turned to the question of drugs, and mentioned some of the emmenagogues and ecbolics in common use. Some patients had told him that they had produced abortion with large doses of quinine, the action of quinine being intensified by castor oil. Savine, an irritant poison, was also used. In Vienna phosphorus was said to be largely employed. Diachylon or lead plaster, which had terrible effects, was another article of common

resort. The nefarious traffic in abortifacients was still going on, especially in shops in side streets, where drugs were advertised "to cure irregularities, suppressions, and obstructions." Everybody knew that if a healthy woman's menstrual periods ceased the cause in 999 cases out of 1,000 was pregnancy. These gentlemen had no justification whatever for their advertisements. It seemed to him that no alteration in the law was necessary. The Home Secretary and the police had only to act promptly and with courage and they could stop the whole thing at once. He suggested that the Home Secretary be asked to receive a deputation from the Medico-Legal Society and kindred bodies, and that a committee be formed of representatives of the Royal Colleges of Physicians of London and Edinburgh, the British Medical Association, and the Pharmaceutical Society, to inquire into and report upon all the proprietary drugs before they were exposed for sale, so that the composition of the drugs might be known, and also for what purpose they were intended.

Dr. R. A. LYSTER said that the law at the present time was satisfactory if energetically administered. Indeed, it dealt with abortion-mongering in a fairly drastic manner, the reason being that years ago, when the law was framed, a very serious view was taken of the moral aspect of the case and of the sanctity of the embryo. Later certain other important considerations had emerged—namely, that abortion was a very serious factor in infant mortality and maternal invalidity. A successful abortion very often meant a damaged woman; an unsuccessful abortion a damaged woman and a damaged child also. He imagined that the fatalities from abortions or attempted abortions were tending to decrease, thanks to a more general appreciation of asepsis, antisepsis, and after-care; the question was whether the damage resulting was tending to decrease as well. There was a fashion in abortions, and a recent number of sudden deaths from shock illustrated the fact that the modern fashion was by means of intrauterine injections. Had the public modified its view as to the criminality of abortion? Would the great mass of new women voters cast their influence in this direction? It would be rash to prophesy when so soon one might be discovered entirely wrong, but the position was well worth considering. Could the law be tightened up? Diachylon, or lead plaster, was put in Part I of the Poisons Schedule because its easy purchase was regarded as a public danger, but he doubted whether this had had any appreciable effect upon the general tide of abortion. Although lead was the surest abortifacient known to-day, difficulty in obtaining it simply switched people on to other means. A great deal of nonsense was talked and written about the action of certain things in producing abortion. A healthy normal uterus could only be induced to abort with very great difficulty, and all the alleged ecbolics might be given in vain. If the uterus was not inclined to abort all these drugs were useless. This was taken advantage of by abortion-mongers, who applied their methods as nearly as possible at a menstrual period when the uterus had an inclination to contract. The only certain abortifacient was a general poison, and the common general poison was lead. A woman who had taken lead successfully and produced abortion was a woman suffering from all the signs and symptoms of general lead poisoning, with one other—namely, contraction of the uterus, with expulsion of the embryo, commonly, not always, preceded by the death of the embryo, but invariably by serious damage to it. Abortion was a grave national danger in its effect on the physique of women and children, but a campaign embarked upon too precipitately without due regard to possible changes in public opinion might create more difficulties than it settled.

Sir BERNARD SPILSBURY spoke of the appalling frequency of abortion. A general practitioner, called to a case of miscarriage, could never be quite certain whether it was natural or had been procured. The estimate of 25 per cent. of all abortions as criminal was certainly not too high. Most of the serious cases of drug abortion which caused death had occurred in past years; in recent years the drugs used were not frequently drugs endangering life—many of them were drugs which one would be inclined to regard as comparatively harmless, and for some other purposes very useful. These drugs must often have been taken successfully by women who aborted readily, and thus they got a reputation. When abortion was induced eventually by instrumental means it was found almost invariably that previous unsuccessful resort had been made to drugs. The use of dangerous ecbolics seemed to be more or less restricted to those who had legitimate access to them—namely, doctors and chemists. Quinine just after the war was largely used for abortion; he saw two fatal cases about 1920, in which large doses had been taken. One of the most effective of the ecbolics, pituitary extract, fortunately did not lend itself to administration by the layman. With regard to general poisons, again, the number of cases of poisoning by drugs used to procure abortion had greatly diminished of recent years. He had not seen a fatal case of poisoning of this description since 1918, and now that diachylon was much more difficult to obtain, such cases had still further diminished. Mercury, phosphorus, and arsenic were only rarely used, and he thought they could be regarded as playing an unimportant part in the question. It was a very different story with the heterogeneous group of drugs so widely advertised for "female irregularities." The most important were the drastic purgatives, for which there was, no doubt, a big sale at the present time. Could legislation stop the sale of these drugs without interfering with their legitimate purpose? One feature of all the drug abortions was that the abortion was like a natural one, not liable to be followed by the dangers consequent upon the use of instruments, such as shock, loss of blood, and sepsis. That was why there was so little information as to how far drugs of this kind were used for the purpose. In addition to purgatives there was a whole host of other drugs offered, agents apparently possessing very small value. No drug, of course, could be accounted harmless if it had any reputation at all. Even pennyroyal and many patent medicines had been used, and it was stated that the desired results had followed. But he could not help feeling that with the present schedule of poisons there was such a restriction on the sale of dangerous drugs that the others could be left on one side in the hope that the public would soon be educated with regard to the unlawfulness of attempting to procure abortion by this or that means. There had no doubt been a change of opinion of recent years as to the criminality of abortion, and in the districts where the professional abortionist carried on his work he was exceedingly popular; he got the most dreadful results, but his popularity did not seem to wane. In spite of frequent fatalities and the announcement of them in the press, instrumental means were still being used very widely. On an average recently he made a *post-mortem* examination on a fatal case of abortion about every ten days; in the vast majority of cases these were criminal abortions, and, again in the vast majority, had been brought about by instrumental interference. It was to the education of the public in the wrongfulness and especially the danger of abortion that one must look for an improvement in the situation. The abortionist, skilled or unskilled, was a public menace. He knew that he went about in fear of prosecution, therefore he had to practise his calling with haste and secrecy, which meant that he had to operate under unsatisfactory conditions, and to run considerable risk of sepsis, so that even the skilled abortionist got most dire results.

Mr. BECKWITH WHITEHOUSE said that a great number of the abortifacients sold to-day were, fortunately for the woman, frauds imposed upon the credulity of the public. Again and again practitioners were faced with a request or a demand from a patient for medical treatment after she had been taking some proprietary preparation which had failed of its expected effect. What always amazed him was the moral attitude of the woman who set her mind upon the termination of her pregnancy. No argument or threat would turn her from her path. During the last six months he had been approached by five patients with a request, expressed or implied, to terminate their pregnancies; four of these were married women. Needless to say, there was nothing to justify operative intervention, and he refused. Two of the married women, however, induced another medical man on what he considered medical grounds to perform an operation. One of them developed pelvic

thrombosis, and had been in bed since August. Another induced abortion by injecting hot water into the uterus in the bath. She did herself much injury, and had a stormy convalescence. Among the poisons or noxious things principally used in the obstetrical underworld were lead, savine, aloes, pennyroyal, quinine, and occasionally, in his part of Worcestershire, tansy. Some years ago in Birmingham it was common to take lead, and cases of plumbism were frequent. It was to be hoped there would not be a revival for abortifacient purposes of lead in its colloidal form. As for instruments, a popular one was known as "slippery elm"—a piece of elm wood. The *British Medical Journal* in 1898 (ii, p. 749) mentioned the case of a woman who had introduced a thick knitting-needle into the uterus thirty-five times! An argument against the absolute prohibition of drugs, apart from the fact that some of the drugs used were of value for legitimate therapeutic purposes, was that such action was likely to be followed by a more extensive use of mechanical, and therefore more dangerous, methods, the comparatively safe and innocuous pill giving place to the septic and pointed crotchet-hook. One way of tackling the problem would be to call the attention of women to the risks to their future health and happiness which every operation, criminal or otherwise, involved. Recently he had been paying some attention to the corpus luteum. There was evidence that if pregnancy was suddenly and violently terminated while this structure was in full course of development a deleterious effect upon the corpus luteum was brought about which might be a factor in the production of lutean cyst. Abortion might have a more lasting effect upon the individual than was commonly suspected, and if this were made known it was possible that it would serve as a deterrent to criminal action.

Mr. H. D. ROOME (prosecuting counsel to the Crown) referred to the case of a clerical abortion-monger, the Rev. Francis Bacon (*British Medical Journal*, 1928, i, p. 329), whom he had prosecuted at the Central Criminal Court. This man conducted a mail order business in abortifacients. He had preparations labelled in increasing degrees of potency, and the most potent, consisting of a large quantity of quinine, aloes, and ergot, was recommended by him as an infallible cure for "female irregularities." In order to make a defence in advance he put on the mixture, "This preparation must on no account be taken by pregnant women." Mr. Roome agreed with a previous speaker that the law required no strengthening. The whole law regarding abortion was contained in two short sections of the Offences against the Person Act, 1861. The first of these sections made it a criminal offence for any person to use an instrument or any other means whatsoever, or to administer any poison or noxious thing with intent to procure the miscarriage of any woman, whether she be or be not with child. The penalty was penal servitude for life. The second section prohibited the supply or procuring by any person with a like intent of an instrument or anything whatsoever, or a poison or any noxious thing, and the penalty was five years' penal servitude. A "noxious thing" was regarded by the judges as any preparation administered in sufficient quantities to be likely to produce abortion; therefore a drug like quinine, on the face of it perfectly harmless, would, if administered in such quantities, bring the administrator within the statute. The ecbolics within the schedule of poisons included ergot, savine, arsenic, cantharides, tartar emetic, belladonna, and lead. Many reputed ecbolics and emmenagogues—the latter very often mere subterfuges for ecbolics—were supplied by persons who advertised themselves under women's names, holding themselves out as sympathizing with women in distress. The Rev. Francis Bacon headed his advertisements, "As woman to woman." In all these cases the law was drastic and sufficient. Something might be done by scheduling in the Pharmacy and Poisons Act any other preparation which in medical opinion was sufficiently dangerous to warrant it. The speaker himself believed that there was no infallible ecbolic, though even gamboge, hellebore, pennyroyal, or oil of juniper, if administered at a critical time, was extremely likely to bring about abortion, and something might be done if these were scheduled. The real cure was change of public opinion, and if there was more toleration and charity for the unmarried mother it would go a long way to stop one prolific cause of abortion.

Dr. G. ROCHE LYNCH (senior official analyst to the Home Office) agreed that the first resort of the woman who desired to terminate her pregnancy was to drugs. Many of the drugs sold to her had no abortifacient action whatever; they were simply frauds. He knew of one case where an unfortunate girl spent £40 on drugs which, on analysis, were shown to consist of iron salts, starch, garlic, sage, and clover. Of drugs of the more harmful type, far and away the commonest sent for analysis was the aloes pill, generally combined with iron. Others included quinine and some of the essential oils, such as pennyroyal and tansy, and occasionally savine. Very rarely one came across ergot, and lead had completely disappeared. To put lead itself in the Dangerous Drugs Act would be futile. There were cases on record of abortions induced by people taking a piece of old lead pipe, steeping it in vinegar for a week or two, and drinking the liquid. A great deal of this harmful traffic would be limited by preventing the selling of drugs of this class by anybody not a qualified chemist. As far back as 1914 there were some strong recommendations made about the trade in abortifacients, and it was said that the law was chaotic and had proved inoperative, but the sale of such drugs was in practically the same state to-day.

Miss SUSAN MUSSON (general secretary of the National Council for the Unmarried Mother) spoke of the large number of cases which came the way of her society in which drugs had been taken with a view to producing abortion. Very many of these girls had not the smallest idea that they were doing anything wrong. Among the abortifacients used, quite a common one in the East End was gunpowder taken in gin. Another very popular one was known as "hickery-pickery." (Sir WILLIAM WILLCOX said that this last was hiera-picra, a mixture of aloes and canella alba.)

Lord RIDDELL mentioned what had been done by concerted action on the part of the newspapers to stop advertisements of these drugs. As a result such advertisements were much less common than formerly.

Dr. NORMAN HAIRE said that as a well-known advocate of birth control he received as many applications to perform abortion as any practitioner in London. He always refused them, though he never pretended that he did so on moral grounds; he refused because it was criminal and against the law. But there was a considerable body of opinion amongst cultured people of high ethical standing that while abortion was a crime it was not necessarily a moral offence, and the question was how far that would come to be taken into consideration from the legal point of view. In Russia, under the Soviet, abortion up to three months' pregnancy was legal, and a similar law had been drafted in Czechoslovakia, while in Austria and Germany public opinion, especially medical opinion, was tending in the same direction.

Professor LOUISE MCILROY mentioned the great ethical difficulty created by the large number of cases which came to hospital following an induced abortion. It always seemed to her a pity that no method was available to the medical man or woman, seeing such cases and knowing the facts, of preventing further abortions. What should the attitude of the medical profession be, with due regard to professional secrecy, in such cases?

Sir WILLIAM WILLCOX, in closing the discussion, said that the opinion of a part of the medical profession with regard to this question appeared to have altered of recent years. At a discussion on the subject at the Royal Society of Medicine two years ago (*British Medical Journal*, 1927, i, p. 188) he was astounded at the opinions expressed by some members of the profession with regard to the moral aspect. They seemed to regard it as it was said to be regarded in Russia and Czechoslovakia. References had been made to the scheduling of abortifacient drugs. It was a difficult question, but probably the law relating to the sale of poisons would be completely altered and reformed in the near future. In the report of the Departmental Committee now in the stage of production it was not unlikely that great changes in the scheduling of poisons would be recommended.

VACCINATION IN THE LIGHT OF RECENT EXPERIENCE.

IN the Section of Epidemiology of the Royal Society of Medicine on January 24th, under the chairmanship of Dr. F. E. FREMANTLE, M.P., Professor J. C. G. LEDINGHAM opened a discussion on vaccination in the light of recent experience.

Professor Ledingham said that much of the new knowledge about the vaccination process, perhaps the most important part of it, had emerged from comparatively recent experimental research, not only on vaccinia and small-pox, but on virus diseases generally. The impression which recent work left on his mind was that in the process of accommodation of the small-pox virus to the rabbit or calf some element responsible for producing generalized lesions as distinct from general invasion was lost; this element might conceivably be another virus. There was good evidence that vaccinia afforded better protection against small-pox than small-pox did against vaccinia. What might be called the "attenuated virus" in the Jennerian or Pasteurian sense remained the most efficient immunizing agent. It was possible, however, that variola-vaccine of known recent origin might be still more effective than vaccinia as ordinarily propagated. There was no more pressing problem than that of the standardization of the immunizing powers of viruses, and especially of vaccine strains. Professor Ledingham regretted that the continued prevalence of mild small-pox in this country during the past seven or nine years had induced so few health authorities or physicians to furnish systematic accounts of it in all its bearings. He preferred the designation "alastrim" for this disease, because, so far as he had been able to contrast what records we had of it with those of the South American and South African types, he had failed to note any outstanding differences. While he used the word "alastrim" for convenience of nomenclature, he did not ignore the fact that the disease was a small-pox variant. Was it a fixed and stable variant or a mutant? In all probability it was stable. When it was alleged that case mortality had risen to a significant percentage in a country in which it had previously been well under unity in spite of thousands of cases, he thought it would be found that sufficient consideration had not been given to the possibility that the virulent form of small-pox had been somewhere incident alongside the alastrim, but without definite transitions. His reading of Rajchman's recent analysis of small-pox incidence and case mortality in many countries (*British Medical Journal*, 1928, ii, p. 521) would seem to justify the conclusion to which Rajchman arrived, that two entirely distinct types of small-pox prevailed which apparently bred true. The virulent form had a mortality rate which fluctuated, in long waves of six or seven years' duration, between 10 and 30 per cent. The mild type, on the other hand, had minimal figures ranging from 0.1 to 0.3 per cent. There was no evidence that minimal periods in case mortality of the virulent type were simply transitions towards an alastrim period with its negligible mortality. The result was important, and went at any rate some distance towards the controverting of arguments based on a reputed increase of case mortality rates in countries where alastrim was widely prevalent. The speaker next made a brief reference to post-vaccinal encephalitis. Much had been made of the constancy of the period after vaccination at which nervous symptoms commenced in such cases, but he took the view that the apparent constancy of this period might fit equally well with the theory which presupposed some latent neurotropic virus in the vaccinees to be activated by vaccinia. Fortunately these cases of post-vaccinal encephalitis were rare; practically all of them had been primary vaccinees, and the great bulk children of school age. The reason why a primary vaccination in infancy was apparently a protection against such accidents in later vaccinations might arise simply from the fact that in the allergic or accelerated reactions exhibited by partially immune subjects the virus was precluded from invading the system, and thus from inducing these nervous disturbances to which the subject might perhaps be liable if the vaccination were primary. He thought the extreme rarity of these cases ought not to be allowed to exercise any unwarrantable depreciatory effect on the practice of vaccination, but this new experience should have the effect of furthering infant vaccination and of inculcating perhaps greater circumspection and caution in the primary vaccination of older children and adults. Finally, Professor Ledingham indicated certain lines on which a discussion involving the practice of vaccination might usually run. Was the mild small-pox or alastrim worth preventing by vaccination? It was said that many persons would rather have alastrim than vaccination; nevertheless, a residuum of cases of alastrim were characterized by troublesome symptoms. If it was necessary only to consider the individual victim, who had, indeed, only himself to blame for his neglect, and he and his equally neglectful contacts took all responsibility, including financial, it might be expedient to "let the disease rip" and save the public purse. But the variola tradition would be likely to prevent the public health officer from acquiescing in this view. Variola had always been ranked with plague and cholera as the death-dealing diseases against which a civilized community must protect itself; consequently, though alastrim was practically harmless, all the expensive paraphernalia of small-pox control and hospitalization must be maintained. Vaccination and revaccination could "deliver the goods," and was cheaper. So why not consider vaccination afresh, and not as a traditional century-old policy? How were the merits of vaccination to be spread abroad? No serious attempt had ever been made to explain to all and sundry what vaccination was and did. The man in the street could talk about the planetary systems of an atom, but he had little notion of vaccination except that it had something to do with sore arms and possibly a calf. Cheap and authoritative pamphlets were wanted as part of an educational crusade, but not designed after the cold-blooded manner of the income tax form. Further to recommend it, he suggested that in the light of the nervous sequels it might be expedient to reduce the dose to one insertion, especially for primary vaccination at school age, on the chance that there might be some correlation between the dose of vaccine virus and the degree of risk of some latent parasitism being stimulated to activity. The reduction to one insertion would also diminish the risk of septic troubles; but the procedure could only be fully justified if revaccination in similar fashion and at the time of leaving school was made a routine practice. Finally, he suggested that compulsory vaccination—such as it was, or was not, at the present time—might be abandoned for vaccination on a purely optional basis, and be introduced to the people at large with the accompaniment of a sympathetic and informative propaganda. By concentration on the education of the public as to the value of vaccination, and by removing what compulsory elements remained in the Vaccination Acts, he thought it possible that a very much larger total of voluntary vaccinations and revaccinations might be secured throughout the country.

Dr. C. KILLICK MILLARD (M.O.H., Leicester) was glad that Professor Ledingham had spoken so frankly about small-pox and alastrim being two separate entities; it was time this was officially recognized. He preferred to call the two conditions major and minor small-pox; they were closely related, of course, and the latter might be a stable variant or a mutant, but there was a fixed difference. He doubted whether in any outbreak there had ever been a question in the minds of those called upon to deal with it as to whether the major or the minor condition was involved. The present position from the statistical point of view was very unsatisfactory. The two things were lumped together in the same column without discrimination. What possible value would posterity attach to our small-pox statistics? He could not help thinking that the lumping together of these two things as a single entity had been largely under the influence of ulterior considerations. Professor Ledingham had referred to the variola tradition. There was such a thing as a vaccination tradition, in which medical men were, unfortunately, brought up, and which influenced their attitude throughout life. He took exception to the remark that vaccination and revaccination "delivered the goods." It sounded very clear and definite, and if the reference

was to the individual there was no question about its truth, but if the reference was to the community it was doubtful whether the statement could be justified. In what community had vaccination and revaccination effectually prevented small-pox and small-pox deaths? It was quite easy for laboratory epidemiologists to take a piece of paper and say that vaccination performed every five or ten years would immunize the individual, and that it followed that if all the individuals in the community were taken and vaccinated at certain periods the community would be protected. But in practice this could not be done. The attempt to do it in a country like ours had failed, and always would fail. When he first went to Leicester vaccination on wholesale lines was quite out of the question, but the isolation and prevention of contacts was readily available, and there had not been a single death from small-pox in Leicester for many years. Now that major small-pox had left the country, and what one had to deal with was a minor non-fatal small-pox, the whole attitude towards this question was ready for readjustment. What justification was there for attempting to force vaccination upon the community? It was a proposition which would never be accepted by the people of this country unless virulent small-pox came back in a form which could not be controlled.

Sir GEORGE BUCHANAN agreed with Professor Ledingham that the extent to which vaccination could be effectively recommended to the people of this country would depend upon the question of the safety of the procedure. It was true that the risks from vaccination were, relatively to the immense number of vaccinations which took place without the smallest mishap, of a very minor order indeed; but the point was that the small-pox experienced in this country of recent years was of so mild a type that the average parent would only assent to this precautionary measure if he was assured that it involved not the slightest risk. These possible risks should be investigated very fully, and every bit of new knowledge which tended to their removal should be worked out. This was not solely a British problem. The rare cases of post-vaccinal encephalitis had occurred in other countries, notably in Holland. On the Vaccination Commission it had been felt to be very important to ask administrators in various countries to do what they could to ascertain whether any chance cases of post-vaccinal encephalitis were occurring in their areas without their knowledge. Certain countries, especially the Scandinavian, had undertaken to make an extensive search and report the results.

Dr. MONCKTON COPEMAN believed that probably the first occurrence of alastrim in this country was at Cambridge in 1903. About that time he had a talk on the subject with the late Sir Clifford Allbutt, who, in reply to his (Dr. Copeman's) suggestion that he felt certain that this would turn out to be a variant of small-pox, said: "Well, if this is small-pox there is an end of all diagnosis!" At a later period Sir Clifford Allbutt made acknowledgement of Dr. Copeman's truthful prediction. The alastrim which occurred at this period was of a more severe type than in most of the recent outbreaks, the mortality was distinctly higher, and it was interesting to observe a considerable difference in the mortality rate as between the vaccinated and unvaccinated, showing that in alastrim vaccination had a considerable effect. In his mind there was no question that alastrim was a variant of small-pox, and not a separate disease. He thought it unfortunate that originally vaccination should have come under the administration of the Poor Law, which gave it a certain stigma, but in the future, with this service placed alongside other public health services, an improvement in public appreciation might be expected.

Dr. R. P. GARROW said that those in a position to make observations about the disease from personal observation—that is, medical officers of health—did not, as a rule, care to express views which were not quite orthodox. Official medicine liked always to look in the same direction. On the question of variants, he was of opinion that there were two diseases. He had been medical officer of health for eight years in a town (Chesterfield) where the mild disease had never really vanished from the vicinity. It had not been in the town itself, but in the surrounding district of north-east Derbyshire, but vaccination was less prevalent there now than at the beginning. People had come to discover that an attack of this disease, on the whole, was better than submission to vaccination. It involved quite a pleasant three weeks in hospital, and they received their insurance money. He did not think the disease was worth preventing, at all events if it meant detriment to the true cause of vaccination by describing the disease as loathsome and fatal when it was neither. He had seen 2,000 cases, and had never witnessed anything suggestive of haemorrhagic or toxic phenomena. It had been repeatedly said that the disease was increasing in virulence; he had visited parts of the country from which these statements emanated, and had found no evidence in support of any change whatever in the character of this disease. What Dr. Millard had really meant was that vaccination did not protect the community because the community did not avail itself of the protection. There were communities completely protected because completely vaccinated. He asked Dr. Millard to reconsider his position. If he admitted, as he appeared willing to do, that a community vaccinated and revaccinated 100 per cent. was a community in which he could not conceive a case of small-pox occurring, then he should cease to repeat that vaccination, while protecting the individual, did not protect the community.

Sir WILLIAM HAMER asked the Section seriously to consider whether there was really any evidence that this encephalitis in recently vaccinated children was anything more than a purely fortuitous occurrence.

Dr. R. W. JAMESON said that it was all very well to declare that vaccinia might activate some latent neurotropic virus, but nobody could say that these children who died of post-vaccinal encephalitis would have died had they not been vaccinated. That was the point which would affect the general public. It was asserted that in infant vaccination post-vaccinal encephalitis was not forthcoming, but in children under 1 year old who died the cause of death, which might be put down as marasmus and convulsions, was often not really known. There was no justification for saying that post-vaccinal encephalitis was even uncommon after infant vaccination. The vaccination condition in the case of infants ought to be stated on the death certificate. To talk about vaccination and revaccination in non-epidemic times was just about as practicable as to talk about staying in bed to avoid street accidents. As to propaganda among the general public, vaccinists were not ready to conduct it; they did not know the protective value of vaccination, the duration of the protection, or the infectivity of small-pox. All they knew was that vaccination did confer some temporary immunity, very much more lasting in variola major than in variola minor.

Dr. MAJOR GREENWOOD thought Dr. Garrow illogical in his attack on the logic of Dr. Millard. Much nonsense was talked about vaccination having modified the epidemiological history of small-pox. The fact was that in respect of the whole question of herd immunity as against individual immunity we were as yet only at the very beginning.

Dr. J. A. H. BRINCKER (London County Council) gave a brief account of recent experience amongst London school children. During the last two years this mild small-pox had infected children attending forty-six of the council schools, and in these schools vaccination was performed in so far as the parents consented. Something like 6,000 children had been vaccinated in this way, and until a week or two ago there had been no case of post-vaccinal encephalitis, but during the Christmas holidays one case occurred, with a fatal termination.

Dr. S. P. BEDSON hoped that the possibility of finding a better method of prophylactic vaccination would not remain unexplored. He did not think it possible to popularize the present method because of the fatalities that had occurred, however few in number these might be. Professor ARTHUR ELLIS concurred; he had seen four healthy children who within three weeks were dead of post-vaccinal encephalitis. This very serious condition was recognized by the authorities as far back as 1922, and there had been more deaths from post-vaccinal encephalitis than from small-pox. A more efficient type of vaccination was certainly needed, and a lead had been given by the work on the filter-passing

viruses. Dr. KNOWSLEY SIBLEY asked some questions about the necessity for more than one inoculation, and also as to the origin of the lymph, which last he thought a matter of great importance from the public point of view.

Professor LEDINGHAM, in reply, said that he could not see the logic of Dr. Killick Millard's position, but he was not prepared to discuss the subject; Dr. Garrow had dealt with it effectively. A more safe method of vaccination was, of course, greatly to be desired. These methods of immunization were always somewhat of an experiment, but, happily, human volunteers had never been lacking, and they had rendered fine service. Research on a large scale on post-vaccinal encephalitis had not yet been conducted; it was only of recent years that these serious accidents had occurred. Workers on the subject were in the dark as to why they should have happened, but he could not agree with Sir William Hamer that they were fortuitous.

Reviews.

CHRONIC ARTHRITIS.

IN the preface to his book on *Chronic (Non-tuberculous) Arthritis*[1] Mr. A. G. TIMBRELL FISHER points out the large amount of suffering and disability in this country due to so-called "rheumatic" diseases. The chief medical officer to the Ministry of Health has estimated that this group of diseases is costing the country in sick benefit alone some two million pounds a year, and half of this wastage is due to chronic joint disease. Yet after many years of experience we are not in a position to substantiate any theory of etiology, pathology, or treatment; and even diagnosis, as far as classification is concerned, is a subject of dispute. Some forms of the disease have existed since prehistoric times, and for generations they have concerned medical authors and spa physicians, yet therapeutic progress has been small. Mr. Fisher, rightly as we think, would have us go back to Hunterian principles and study with the help of all modern means first the physiology of joints and then the pathology of arthritis, before attempting classification or laying down rules for treatment. He has acted on these principles, and the book before us sets forth clearly the results of his labours.

Beginning with a study of the histology of joint-structures and an experimental investigation of their reaction to injury or toxins, Mr. Fisher goes on to discuss the pathological appearances found in various joints in divers stages of disease. The result of this investigation is the demonstration that, to a very large extent, the changes which occur, especially in cases of osteo-arthritis, are of a compensatory or curative nature. Those students of this subject who have been bewildered by the elaborate systems of classification adopted by some writers, notably on the Continent, will be relieved to find that, although he recognizes much variety and many differences between individual cases, Mr. Fisher divides all cases into two broad classes—namely, rheumatoid arthritis and osteo-arthritis. The first type is preponderatingly toxic in its etiology, and likely to be found in those with an hereditary predisposition; the other is caused by trauma and defective nutrition of joint cartilage, from whatever cause these may arise. Osteo-arthritis may, however, be secondary to rheumatoid arthritis, the latter acting as a cause of malnutrition, and thus indirectly of a lesion of the joint cartilage and the underlying bone.

As regards treatment, Mr. Fisher lays due stress on the importance of orthopaedic measures in the management of the disease in all its stages. He emphasizes the importance of knowing when and in which cases movement should be encouraged, and in which cases ankylosis in the most favourable position should be aimed at. Operative treatment such as arthroplasty, cheilotomy, and excision receives full consideration. Such subjects as gout and neuropathic joint disease are briefly dealt with, but the author has wisely devoted most of his attention to so-called rheumatic arthritis.

This work represents a most painstaking and illuminating attempt to set the physiology, pathology, and treatment of joints and their disorders on a more sound basis than heretofore. Mr. Timbrell Fisher has established the existence of facts hitherto unknown and has made valuable contributions to our knowledge. His book is to be recommended to everyone who is interested in the study and relief of chronic joint disease. The illustrations are many and excellent.

BEDSIDE DIAGNOSIS.

IN choosing the title *Bedside Diagnosis*[2] for the four handsome volumes which have recently appeared under his editorship, Dr. GEORGE BLUMER's object has been to call attention to the importance of observation by the unaided senses, or at least by the senses aided only by such simple instruments as the clinical thermometer and the stethoscope, and by those examinations which any physician can make without extensive laboratory equipment. In many of the more recent publications, both in this country and in America, there has been a wholesome tendency to stress the importance of purely clinical observation and to combat the dangerous idea, which threatened to win popularity, that medical diagnosis was becoming mainly instrumental—an affair of test tubes and *x*-ray photographs. Dr. Blumer, in his preface, very wisely remarks that new methods of a technical nature are continually appearing, and there is a constant tendency to overrate these in spite of the fact that under the test of wider experience many of them prove to be of little value. On the other hand, there will never be a time when the use of the senses will cease to be the most important factor in diagnosis. Thus in the work under review, while all modern laboratory tests are mentioned in their appropriate places, the greatest emphasis is laid upon the methods of complete and thorough physical examination of the patient.

The complete work is a symposium in which sixty-four authors have taken a share, each subject being treated by a specialist recognized as such in his own particular sphere. The art of diagnosis alone is discussed; no attempt has been made to present a complete textbook or to deal with therapeutics. That the subject has been very thoroughly treated is shown by the fact that the articles fill three stout volumes. Volume I is devoted to the infections and intoxications, deficiency diseases, metabolic diseases, developmental diseases, diseases due to physical agencies, such as compressed air, fatigue, heat and cold, and the diseases of the locomotor and digestive systems. Volume II deals with the liver and gall-bladder, the pancreas, peritoneum, lungs and bronchi, mediastinum, the circulatory system, the blood, lymphatic system and spleen, and the urinary system. In Volume III are described disturbances of the endocrine system, the nervous system, and vasomotor, trophic, and psychiatric conditions. In each section adequate space is devoted to the discussion of differential diagnosis, and very complete lists of references to original papers are given with each chapter. Each volume is furnished with an index to its contents, while the fourth volume of the series consists of a general index for the whole work—a very useful aid in giving speedy access to any particular point the reader may desire to refer to, and of a size easy to handle.

It would be impossible in a work of this magnitude to review every section in detail; we must be content with noting the general high standard of excellence of the articles; they are uniformly just of the right length for the subjects touched upon, and nothing of real value seems to have been omitted. The subject-matter is presented in a straightforward manner and with very few of those peculiarities of literary style which arouse a feeling of irritation in the English reader. We hesitate to single out any one section for praise, but we may perhaps call particular attention to the chapters dealing with disturbances of the endocrine system. This section is of special interest, and has been handled in a very well balanced manner by the author, Dr. Hans Lisser. The photographic reproductions are very numerous, and have been

[1] *Chronic (Non-tuberculous) Arthritis.* By A. G. Timbrell Fisher, *M.C.* London: H. K. Lewis and Co., Ltd. 1929. (Demy 8vo, pp. xii + 232; 193 figures, contained in 93 plates and the text. 25s. net.)

[2] *Bedside Diagnosis.* Edited by George Blumer, M.D. Philadelphia and London: W. B. Saunders Company. 1928. (Roy. 8vo: Vol. I, pp. xvi + 898, 155 figures; Vol. II, pp. ix + 854, 237 figures; Vol. III, pp. viii + 1058, 498 figures; Index, pp 143. £6 15s. net the set.)

chosen with a due regard to the points it is wished to illustrate. The *x*-ray pictures of the sella turcica in abnormal conditions of the pituitary body are really fine, of their kind real works of art.

The four volumes are well printed and bound, and should make a handsome addition to the library shelves of any practitioner, be he general or special.

DENTAL MEDICINE.

MR. F. W. BRODERICK believes he has found the constitutional cause both of dental caries and of pyorrhoea, and under the title *Dental Medicine*[3] elaborates his theories. Briefly, he holds that dental caries is dependent upon a condition of acidosis, and that pyorrhoea is the result of a compensation for an alkalosis. Restating his thesis with regard to dental caries, the author says:

> "It amounts to this. That in the compensation of a tendency to an acidaemia there is a drain on the available alkali in the body to neutralize the excess of acid, and that under these circumstances lime salts that are usually provided for such purposes as stabilizing the alkalinity of the saliva, and through this of hypercalcification of the teeth, or of providing the necessary salts for bodily repair and replacement, and all the other purposes for which calcium salts are required to keep the organism in health, are no longer available; that under these circumstances, if local conditions are favourable, a very definite breaking down of the tooth tissue may result, which will terminate in that condition that we designate dental caries."

This, after some two hundred pages of argument, is a rather disappointing presentment of the case. Hypercalcification of the teeth is by no means a proven quantity; and how the very definite breaking down of tooth tissue which will terminate in dental caries is brought about by a saliva of slightly acid *p*H value is not made clear by the author. The determining factor in pyorrhoea is, in his view, an attempt to rectify an alkalosis by the deposition of subgingival tartar from over-alkaline saliva; dirt and infection are not germane to true pyorrhoea, which the author endeavours to show is always associated with a salivary *p*H value of over 7. In considering the application of his theory, Mr. Broderick hopes to produce immunity to dental caries by the avoidance of acidosis, primarily by administration of large doses of sodium bicarbonate, and to pyorrhoea by administration of ammonium chloride, but he warns the reader that the value of the salivary *p*H is dependent on many variable factors. In chapters on civilization as a factor in the problem, and on dental sepsis as a factor in disease, he finds it possible to explain and perhaps rectify a large number of varied disorders by application of his theory—and if he is right dental medicine is indeed a subject worthy of attention.

Our general criticism of a book which will provide much food for thought is that there are too many quotations, and it is difficult to see the wood for the trees.

In common with many others, Mr. F. TALBOT, the author of *Actinotherapy for Dental Diseases*,[4] is seeking a means whereby the constitutional factors of dental disease—caries of the teeth and pyorrhoea—may be utilized as a defensive mechanism, and thinks he has found it in actinotherapy. The general tone of his book is tentative; of local mouth irradiation we read "good results have been reported in the treatment of septic tooth socket and pyorrhoea," and the sum of the argument in favour of skin irradiation in dealing with dental caries and pyorrhoea seems to be "it ought to do good seeing its value in other infective conditions." The clinical evidence which the author offers is not very convincing. The most positive evidence quoted comes from America. Three hundred school children were divided into two groups—control and irradiated. "On reassembling after vacation the latter group showed almost complete arrest of caries, while the former group stood in marked contrast in their progressive caries." The clinical results obtained in pyorrhoea seem to have been less convincing, and the author remarks, "In other cases the disease is so chronic and so dependent upon constitutional conditions that little good can be expected from ultra-violet radiations." But Mr. Talbot has no wish to exaggerate his clinical successes; rather he wants to open out a new field, and his remarks on apparatus and technique, and on the danger signs in the patient, are eminently practical and of themselves make this little book a valuable guide to all who intend practising dental actinotherapy. There is a sympathetic preface written by the late Dr. Robert Knox.

[3] *Dental Medicine.* By F. W. Broderick, M.R.C.S., L.R.C.P., L.D.S.Eng. London: W. Heinemann (Medical Books) Ltd. 1928. (Demy 8vo, pp. xv + 363. 21s. net.)

[4] *Actinotherapy for Dental Diseases.* By F. Talbot, L.R.C.P., M.R.C.S., L.D.S.Eng. With a preface by Robert Knox, M.D., M.R.C.P. London: J. Bale, Sons and Danielsson, Ld. 1928. (Cr. 8vo, pp. x + 84; 6 figures. 5s. net.)

PSYCHOBIOLOGY.

PROFESSOR C. V. MONAKOW and DR. R. MOURGUE, in their *Introduction Biologique à l'Étude de la Neurologie et de la Psychopathologie*,[5] discuss the problems of neural and of psychic activity and disorder from a purely biological standpoint. They approach their subject along much the same lines as those made familiar to us by the writings of Hughlings Jackson, but in contradistinction to what they term his Spencerian mechanism of outlook they expound a system of dynamic psychobiology. To maintain the same terminology in describing phenomena ranging from the lowliest activities to the highest psychic creations would appear to present insuperable difficulties; indeed, the authors point out the inadequacy of many of our current appellations. Such a term as "vision," for example, is commonly applied, as though with equal appropriateness, to a process in invertebrate animals and in man. Such usage, by ignoring evolutionary history, vitiates clear thinking and leads to the identification of widely different activities. If, as the authors maintain, it is desirable to trace the self-same process throughout its evolutionary levels, and describe it always in the same terms, then clearly our current vocabulary is ill suited to the exposition of biological phenomena. For example, such words as "attraction" and "repulsion," suitable for the description of amoeboid behaviour, do not adequately convey higher activities, such as sympathy and antipathy, of which they are yet the basis. The authors suggest the substitution of the works "klisis" and "ekklisis" to cover the whole range of the activities in question. They use the term "protodiakrisis" to designate what in man we are accustomed to call judgement and discrimination. The term "hormé" they use to apply to the mainspring of instinctive action, the primal urge or "élan vital." Since so-called instincts are modified by experience, they have thought it necessary to differentiate between the primitive forms of instincts, which they term "hormétères," and forms elaborated in the course of development, which they term "neohormétères."

Considerable space is devoted to the discussion of what the authors call "syneidesis" or "conscience biologique," the self-regulative principle of the organism whereby the various instincts are unconsciously valuated. This principle, it is pointed out, may be disturbed by suggestion from without, and the authors discuss in this connexion rationalizations made by the subject of post-hypnotic suggestion, and describe other manifestations of what they term "causalité agglutinée."

The work is in two sections, one dealing with integration of function, the other with its disintegration, the conception of instinct in man forming the central point of their study. The authors define "instinct" in purely objective (indeed, in teleological) terms, which, though probably valuable to the biologist, is of little service to the psychologist, who cannot ignore subjective experience. Freud is criticized for his neglect of morphological considerations, and for his undue attachment to the language of associationist psychology. Kraepelin is criticized on much the same grounds.

We are inclined to feel that the time is not yet ripe for a psycho-physiological correlation to the extent which the authors envisage. Their attempt to establish a uniform

[5] *Introduction Biologique à l'Étude de la Neurologie et de la Psychopathologie.* Par C. v. Monakow et R. Mourgue. Paris: F. Alcan. 1928. (6½ × 10, pp. xi + 416; 33 figures, 2 plates. 80 fr.)

biological conception of both fields of thought is eminently praiseworthy, and although at the outset it may prove somewhat bewildering, there is no doubt that the future will see a great expansion of the territory they have explored.

MILK LEGISLATION.

FOR some years past Messrs. J. Bibby and Sons, Ltd., Liverpool, the cattle food vendors, have examined samples of their customers' milk in their laboratory, and helped milk producers with their difficulties, legal and otherwise. As a result of the experience so gained, the laboratory manager, Mr. JOHN HANLEY, F.I.C., F.C.S., has, with the aid of other workers on the subject, written Section II of *Bibby's Book on Milk*.[6] The legislation on milk is given fully, together with annotations by accepted authorities and full reports of the most important cases decided. The main theme of the text written by Mr. Hanley is the injustice which he considers has arisen as the result of the Sale of Milk Regulations, 1901, made by the Board of Agriculture. He puts the position very fairly when he says:

"It was, of course, impossible to define minimum chemical limits for the composition of pure milk, but figures were selected distinctly below the average composition of milk, and it was decreed that when milk was found below these figures (3 per cent. fat and 8.5 per cent. for non-fatty solids) a presumption that it was adulterated or deprived of something arose. This presumption was really intended to compel the vendor to prove the genuineness of the milk, and is in itself an admission that the analyst cannot tell whether it is genuine or not, but that he suspects it."

He then goes on to assert:

"This presumption and the conceptions underlying it have been so badly misused by some and misunderstood by others that it has become evident that it must be abandoned."

He proposes that—

"The law should be amended so that no seller should be convicted on a charge of selling adulterated milk unless the prosecutor proves that the milk was adulterated and that the seller knew or ought to have known it was adulterated. In cases where the above cannot be proved the whole procedure should be shifted from the region of criminal law to that of commercial or civil law. To give effect to this principle there should be an implied contract between milk sellers and local authorities under which the latter could claim a small sum as damages for breach of warranty in any case where milk sold is below a certain standard of quality. . . . The minimum composition stipulated would reasonably coincide with the seasonal variation in milk known to occur in the particular district concerned."

But a large majority of public health workers consider that the present state of the law, as laid down in Hunt *v.* Richardson, is to the prejudice of the public; if the producer can show that the herd concerned gives milk inferior to the standard fixed by the Board of Agriculture he cannot be convicted. The vast bulk of milk produced in this country contains considerably more fat and non-fatty solids than is required by the Regulations, so much so that the advisability of raising the standard rather than the lowering of it might justifiably be considered. It does not seem fair that a producer of so important a foodstuff should be able to place on the market an article which is markedly inferior to that of his competitors and obtain the same price for it. Some large purchasers of milk pay the farmer according to the fat content of the milk: in this book no emphasis is laid on that fact. No one denies that, from time to time, the mixed milk drawn from a herd, and especially the morning milk of a small herd, falls below the standard, but the view generally held is that it then becomes the duty of the milk producer to take such steps as will remove this inferiority. Mr. Hanley points out that any "appeal to the cow" should be made at the next corresponding milking.

NOTES ON BOOKS.

THE third edition of Dr. ELLIOTT P. JOSLIN's book on *The Treatment of Diabetes Mellitus* was reviewed in these columns on February 9th, 1924. At that time insulin therapy was in its infancy, and the author's views on the technique and the indications for its administration would no longer be tenable to-day. The fourth edition,[7] which has been revised, enlarged, and rewritten, brings the account of diabetes therapy up to date. As before, the book opens with a discussion of insulin, but it is a discussion, not of a new agent of unknown potentialities, but of a proved therapeutic technique rapidly approaching stabilization. The author is, however, careful to point out that the treatment of the diabetic has not been simplified by insulin, but has been made more complex. The patient following the course previously in fashion was scarcely affected by small variations in treatment; but the patient taking insulin, to use a metaphor of the author's, is like a rapidly moving machine to which a slight swerve of the wheel will bring disaster. "During the last five years whenever I have read, heard, or seen anything which I felt would be of value in the treatment of my diabetic patients I have recorded it, and later, if on second and third perusal it has seemed worth while, inserted it into this book." This quotation may give some idea of the scope of the book, which deals extensively with the physiology, pathology, diagnosis, and symptomatology of diabetes, the diet of diabetic patients, the surgery of diabetes, and the use of various remedies, such as synthalin, myrtillin, and liver. The chapter on the treatment of diabetes in children is particularly valuable. The great change in the prognosis of diabetes brought about by the introduction of insulin has completely altered the regime of the young diabetic subject; it is now necessary to take long views, to plan a diet and mode of life for many years ahead, in the hope perhaps that, in some cases at any rate, regeneration of the pancreas may occur and the sugar tolerance ultimately become normal.

Professor NELLIS B. FOSTER's book on *The Examination of Patients*,[8] which first came out in 1923, has, after being reprinted three times, been revised, expanded both in matter and by 18 new figures, and slightly increased in price. In this second edition the author has, in response to repeated requests, treated the subject of differential diagnosis in the same concise manner as in his previous description of the methods of examination. The style is attractive, and carries the reader pleasantly along. Thus "Chlorosis has become a rare disease. The substitution of a tennis racquet for a fan has severed kinship between the modern girl and her sister of the eighteenth century novel," and "When there is a suspicion of empyema of the pericardium the question should be decided by puncture. Timidity in tapping the pericardial sac costs many lives." The succinct account of tularaemia bears witness to the revision; on the other hand, in a new footnote on pernicious anaemia, Knud Faber is instanced as prominent among those who consider achylia as the cause of the disease; this is perhaps too definite, for Faber, while admitting that achylia is the most frequent cause, states that it is not the only cause, and insists on a continually recurring intoxication, usually by a protein of intestinal origin, as the essential factor. As a whole the work fully justifies its obvious popularity in America.

With the idea of providing a volume on therapeutics which should be more than a list of suitable drugs, the late Dr. A. MARTINET and Dr. P. DESFOSSES have edited the prescriptions of a general practitioner,[9] using the term "prescriptions" in the widest sense to include everything which the patient must be told. They have the collaboration of thirty authorities, who contribute in all 250 examples. Each of these, under the name of some disease, deals first with the regime as a whole which the patient must adopt, with details as to diet and physiotherapeutic measures. Then follow drugs set out in prescription form, and in certain examples local and systemic treatment are dealt with separately. Indications for special forms of treatment, such as at a spa, follow in some instances. The whole work is well planned, and the introductory example of a general scheme for ordering treatment gives a very clear summary of what a practitioner ought to do.

We have perused *Muter's Short Manual of Analytical Chemistry*[10] and observe that it deals with an extensive field of chemistry within the limits of a comparatively small space. This would appear to be the cause of its chief defect, for while it treats of subjects too numerous for the beginner to deal with, the treatment is not sufficiently precise for the more advanced student. It appears to be intended mainly for students of pharmacy. We think that, useful as the book may be in leading the student to make experiments, he would be well advised not to regard it as the only book he will need, but should rather use with it another work as companion for the sake of obtaining a second view of the chemical facts from another aspect.

[6] *Bibby's Book on Milk.* Section II. Twelfth edition. Liverpool: J. Bibby and Sons, Ltd. 1928. (Med. 8vo, pp. vi + 487; illustrated. 30s.)

[7] *The Treatment of Diabetes Mellitus.* By Elliott P. Joslin, M.D. Harvard. Fourth edition, enlarged, revised, and rewritten. London: H. Kimpton. 1928. (6 × 9¾, pp. xxii + 998; 38 figures, 1 plate. 42s. net.)

[8] *The Examination of Patients.* By Nellis B. Foster, M.D. Second edition, revised. Philadelphia and London: W. B. Saunders Company. 1928. (Med. 8vo, pp. 392; 83 figures. 21s. net.)

[9] *Les Ordonnances du Médecin Praticien:* 250 Répertoires de Thérapeutique Clinique. Paris: Masson et Cie. 1928. (6¼ × 9½, pp. 515; 4 figures. 45 fr. sans majoration.)

[10] *Muter's Short Manual of Analytical Chemistry.* Edited by J. Thomas, B.Sc.Lond. Eleventh edition. London: Baillière, Tindall and Cox. (Roy. 8vo, pp. xiv + 238; 56 figures. 8s. 6d. net.)

A STUDY OF THE MENINGOCOCCUS.

IN a monograph[1] just published Mr. E. G. D. MURRAY of the Department of Pathology, University of Cambridge, gives the results of a close, sustained, and critical scrutiny of the general biology of the meningococcus and of its reactions to its environment. Investigations of the meningococcus conducted during the war generally had a strictly utilitarian purpose; inquiries centred round the problems of the meningococcus as an infective organism, the genesis of the outbreaks of cerebro-spinal fever, and the specific treatment and control of the disease. The detailed bacteriology of the meningococcus and the tolerance and antagonism it meets in the animals it infects; the methods of altering its virulence in artificial media; its cultural requirements; the properties of its endotoxin—these more academic problems, necessarily studied only incidentally in the period 1915–18, have been investigated since the close of the war by Mr. Murray, working under the auspices of the Medical Research Council. A great part of his monograph is occupied with a detailed account of the distribution, morphology, and physiology of the meningococcus, the latter being concerned with its reproduction, cultural characters, and conditions, its fermentation reactions, and its synergic and antagonistic relations with other bacteria. It is interesting to note that the meningococcus seems to be very intolerant of association with other bacteria, both *in vitro* and *in vivo*, a synergic reaction invariably favouring the other organism, and antagonism always being against the meningococcus.

Action of Antiseptics.

Interest in the feeble though varied resistance offered by the meningococcus to antiseptics has been stimulated by the desire to disinfect the nasopharynx of carriers. Weichselbaum has stated that 1 in 22,500 formaldehyde rapidly destroys the meningococcus, and that 1 in 800 phenol hinders its growth. Dopter showed that while a wide range of antiseptics, including mercuric chloride, creosote, lysol, menthol, and formalin, rapidly kills suspensions of meningococcus cultures, others—for example, hydrogen peroxide and wintergreen—are without even inhibitory effect on growth; the most powerful effect he found was produced by eucalyptus. Gordon and his colleagues, in the course of experiments on the disinfecting power of an atmosphere heavily charged with chloramine-T, found that they were able to obtain striking effects both in freeing heavily infected carriers and in reducing the carrier rate in depots where it was high. This method, though producing only a limited fall in the carrier rate, and indeed leaving a considerable residue of carriers after the sprayings have stopped, may have value in keeping down the carrier rate when it is not possible to avoid overcrowding a susceptible population beyond the limit of safety.

Virulence.

The definition of virulence as "the capacity of the bacterium to live and multiply in the living tissues of the host" assumes a potentiality in the bacterium independent of any contributory action on the part of the host. It involves the further assumption that to combat virulence the host must acquire new-formed defence mechanisms; and to explain the varying incidence of the disease a hypothetical "susceptibility" in which individual subjects differ among themselves has to be invoked as well. Such assumptions, in Mr. Murray's view, merely serve to confuse the issue. The defensive forces of the host are primary and secondary. Of the first kind are the adaptations of its physiological processes designed to deal with physical and chemical accidents, and to eliminate unwanted metabolites; other primary agencies are the processes of repair, of excretion, and selection; secondary forces comprise the immunity responses. The defences of the bacterium against the attack of the host involve resistance to phagocytes, rapidity of multiplication, the formation of toxins, and interference with the circulation of the blood and lymph. Failure of the immunity responses of the host may be due to damage to specialized cells by a high concentration of the bacterial forces. In Mr. Murray's view virulence is the resultant of the opposed systems of forces exerted physiologically by both the parasite and its host in the efforts of each to maintain its life and health. Such a definition, besides absorbing the observed facts, has the further merit of delimiting two main lines of investigation—namely, the measurement of the "resultant force" (virulence) and its direction, and the analysis of the contributing "forces" of both parasite and host. Virulence is measured by determining the minimal lethal dose of the living culture by a stated route in a given variety of animal. For the meningococcus it is suggested that the most satisfactory test is the determination of the least amount of viable young culture which, injected intraperitoneally in a single dose, will cause the death of 20 grams of mouse within forty-eight hours.

Determination of Minimal Lethal Dose.

In determining the minimal lethal dose it is necessary to take into account the extent to which the bacterium causes natural disease in the available experimental animal, and the nature, degree, and rapidity of alteration that may occur in the bacterial culture under the conditions imposed by growth on artificial media. Thus in working with the meningococcus the most useful animal is the mouse, in which death takes place within forty hours in response to a dose large enough to be measured with sufficient accuracy. Allowance must be made for attenuation by subculture, and the rapid variability of the fatal dose, by virtue of which animals may resist as much as ten times the mass of cocci which on a previous occasion was lethal. By controlling a variety of conditions—for example, the viability, the purity of culture, the constitution of the media, the phase of growth, and the age and subculture—Mr. Murray has found it possible to establish a minimal lethal dose for the meningococcus which ranges between 8 milligrams and 0.5 miligram for 20 grams of mouse.

Alteration of Virulence by Animal Passage.

In attempting to raise the virulence of the meningococcus by intraperitoneal passage Mr. Murray found great difficulty in recovering the organism from the peritoneal exudate of mice which had succumbed to a large dose of a culture of low virulence. Resort to cultures of higher virulence did not remove this difficulty; nor was it affected by using alternating cultivation and passage, or direct transference from mouse to mouse. Almost invariably, however, Mr. Murray found large numbers of meningococci together with masses of phagocytes in the tightly rolled up omentum of the experimental animal. When a mouse dies as the result of multiple intraperitoneal minimal lethal doses of a moderately virulent strain, very large numbers of healthy-looking meningococci, of which comparatively few are intracellular, are found in the peritoneal exudate. Their presence depends on the animal having received an overwhelming dose, the number of cocci decreasing noticeably as the dose is diminished. The influence of increased doses is to augment the number of cocci, mostly extracellular, in the peritoneal exudate, though the above-mentioned relation to mass of dose can still be made out. The numerical and qualitative relation of phagocytes to cocci has an important bearing on the type of infection. When the total mass of cocci is small the cells for the most part stain normally; when large, only few healthy cells are to be seen. The phagocytosis is shown to depend on the ingestion of cocci, interference with leucocytes which prevents their active participation in the combat not only resulting in the presence of more free cocci but in less damage to the cells. When mice recover the majority of cocci are intracellular, the presence of free cocci and the degree of cellular damage again depending on the mass of the dose.

Evidently, then, the leucocytes play an important part in combating the infection, and it should be possible to raise the virulence of the meningococcus by intraperitoneal passage. Mr. Murray frequently observed, however, that the virulence of a strain recovered from animals would on one occasion be raised and on another lowered, and that there was great variation in the number of viable

[1] Medical Research Council. Special Report Series, No. 124. Price 2s. 6d. net.

organisms discoverable in animals even when the strain which killed them was highly virulent. He assumed, as a working hypothesis, variation among individual cocci whereby some might be more likely to reproduce robust offspring than others, and that the phagocytes and leukines might exercise a selective action. If only the cocci of considerable parasitic capacity survived, the maximum virulence of a strain could be obtained in a single passage; should, however, the resistance of the host be low it would be possible for cocci of mean virulence to grow and even to gain the majority, and so the virulence of the recovered strain would be unchanged or even lowered. Thus the relation between virulence and animal passage is essentially a matter of chance, and it appears impossible to reproduce at will exactly the conditions required.

Interference with the Defence Mechanism.

Mr. Murray found that a dose of meningococcus which failed to kill the standard mouse, and which on microscopical examination proved to be almost completely phagocyted, invariably proved fatal to mice which had received 5 mg. of carmine, preferred by the leucocytes to meningococci, and that the vast majority of cocci were then extracellular. It is thus possible to make a culture appear more or less virulent by active interference with the defence mechanism of animals of average resistance. There is further some converse evidence that the apparent virulence may be decreased by augmenting the defences of the host, thus leading to the conclusion that virulence is not a property of the parasite alone, but the resultant of the physiological forces exhibited by both parasite and host.

Toxin.

Probably in those animals which die as the result of the injection of meningococci, but in which meningococci cannot be demonstrated, the cause of death is the massive liberation of endotoxin by the rapid lysis of the cocci. The presence of endotoxin is demonstrated by the fact that a specially prepared culture free of viable cocci, injected into the animals, proves fatal in a dose which varies from one preparation to another. The amount constituting a lethal dose of intact killed cocci is invariably larger than that of living virulent cocci, a disparity which is more accentuated the more virulent the strain. Further, the lethal dose of intact killed cocci is much larger than that of lysed killed cocci. In the quantitative studies of meningococcus endotoxin it is important to ensure the breaking up of all the cocci present and the liberation of free unaltered contents. Though these conditions have not yet been realized, Mr. Murray demonstrates the possibility of improving certain known methods with ultimate hope of success.

Relation of Endotoxin to Virulence.

Though endotoxin production varies considerably in different strains, any given one will produce endotoxin of as high a value at the end of years of subculture as it did at the beginning. On the other hand, Mr. Murray suggests that it is impossible to persuade a poor producer of endotoxin to improve its product. The production of endotoxin is apparently independent of the loss of virulence by the strain in culture, and is not increased by greatly increasing the virulence of the strain.

Immunity Reactions.

Bacteriologically, anyone harbouring the meningococcus is infected, and the development of the disease to the point at which the reaction of the host appears as signs and symptoms is merely a matter of degree. From this point of view very few people are immune, and from the high carrier rate discoverable under favourable conditions it is evident that their chances of infection depend on the intensity of their exposure. Probably the main natural defence is phagocytosis, the meningococcus being extraordinarily susceptible to lysis within the phagocyte. If there is sufficient inflammatory exudation probably bacteriolysis by alexine comes into play; since the meningococcus exhibits a low order of virulence these natural defences are usually effective.

Acquired Immunity.

Although immune bodies have been demonstrated in the blood of cases of meningitis by a number of workers, the outstanding feature of their investigations is the irregularity of the results. The development of agglutinating power of the patient's serum may fail altogether, and its presence or absence bears no relation to the prognosis. There seems evidence to show that with the serum of cerebro-spinal fever cases phagocytosis is more marked than with normal serum, but the findings of the opsonic test are unreliable because of the many pitfalls in technique. Various workers have demonstrated a complement fixation reaction, but generally without any indication of the agglutinating type of coccus concerned. It has further been shown that the serum of cerebro-spinal fever patients is more definitely bactericidal than normal human serum. Mr. Murray discusses in detail the identification of the meningococcus by its agglutination reaction and the classification of the various strains into distinct bacterial types.

The Production of Antiserums.

In a review of the methods used for estimating the potency of antimeningococcus serum Mr. Murray concludes that the reactions of greatest importance are: (1) the capacity of the serum to neutralize endotoxin; (2) its ability to promote phagocytosis of virulent cocci in the presence of alexine; and (3) its bacteriolytic power. At present, he says, there appears to be very little attempt to standardize antimeningococcus serum, a neglect which is reflected in the therapeutic inefficiency of many of the serums used.

Infection.

In 95 per cent. of all cases of cerebro-spinal fever infection results from contact with the so-called "healthy" carrier. Overcrowding in sleeping quarters offers the greatest danger by shortening the distance between man and man, thus tending to produce a higher carrier rate in a community and facilitating the transmission of infections of the upper respiratory passages. Mr. Murray classifies carriers as primary and secondary, the former being persons with infection of the nasopharynx, but who have not developed meningitis, the latter those who have recovered from meningitis but still retain a nasopharyngeal infection. Primary carriers are further classified as "contact carriers" and "non-contact carriers," the former denoting persons associated with a case, the latter those found in the general population. The contact carrier rate is usually higher than the non-contact carrier rate, but under conditions favouring epidemics these two rates may approach one another very closely. A rise of the non-contact carrier rate to the order of 20 per cent. is a sure "storm signal" of imminent trouble. Primary carriers are, for the most part, infected only temporarily; within six weeks 90 per cent. are free from infection, the remaining 10 per cent. showing varying degrees of obstinacy, though only about 2 per cent. continue to carry over six months or longer.

ROYAL MEDICAL BENEVOLENT FUND.

As grants are made from the income received from subscriptions and donations, subscribers are asked to forward their contributions during the first quarter of the year rather than later, in order that the amount available for distribution may be known and a possible overdraft at the bank avoided. Subscriptions and donations should be sent to the Honorary Treasurer, Sir Charters Symonds, at 11, Chandos Street, Cavendish Square, London, W.1.

At the last meeting of the Case Committee thirty-five applications were considered, and thirty-two grants were voted, amounting to £951. The following short summary gives three typical cases.

Widow of M.R.C.S. who died in 1926, leaving her with two children—a girl, aged 16, and a boy, aged 13. The widow is now supporting herself in domestic service. The Fund was asked to assist in the education of the two children, £45 being required for the boy and £36 for the girl for her last two terms. Voted £20 to each child; the Fund is arranging with other societies to contribute the balance.

Wife, aged 38, of L.M.S.S.A. who has had a complete mental breakdown and is subject to dementia paralytica. The wife has no private means and has a girl of 7 to educate. Her father-in-law is making an allowance of £39 a year, the Freemasons £26, and other charities £15, making a total of £80. Fund voted £26, and has referred the case to the Guild to arrange for the education of the child.

Daughter, aged 68, of M.R.C.S. Since her father died the applicant has lived on £53 a year, bad eyesight and deafness having prevented her from working. In consequence of her privations her general health has suffered, and owing to her increasing infirmities she will soon require someone to attend to her wants. Her income has recently been increased to £73 a year. Fund voted £26.

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NEUROSIS AND ACIDOSIS.

THE "nervous child" seems to be attracting to itself almost as much attention from paediatricians as it demands in the domestic circle; nor is this to be wondered at, for the vagaries of nervous children are such that the medical attendant is in danger of losing credit at least as much as the harassed parents themselves. We may piously hope that these patients will fare better in an atmosphere of scientific investigation than they do in the limelight of parental solicitude, yet it is painfully evident that the medical aspects of the problem of neuropathic children are interpreted very variously to-day by different authorities.

Dr. H. C. Cameron, who has written so illuminatingly on the problem of the nervous child, now presents, in the lecture published this week at page 185, a study of the metabolic instability to which he thinks these patients are peculiarly prone, and on which he lays great stress from the point of view of the prevention and treatment of many of their troubles. His thesis is that nervous children, because they are nervous, are particularly liable to acidosis, and that this acidosis in its turn exaggerates and precipitates the nervous symptoms and attacks. He regards the nervous child as living upon the verge of acidosis, in a condition, as he calls it, of "smouldering acidosis," which the accidents of its ordinary existence may render a positive factor in the production of active symptoms. With this twofold association of neurosis with acidosis, and of acidosis with neurosis, the vicious circle is complete. Particularly interesting is Dr. Cameron's suggested explanation of why the nervous child is so subject to acidosis. He thinks—though he admits that it is no more than speculation—that the association is attributable to adrenal exhaustion. He surmises that the restless, overactive, overemotional state of the nervous child is responsible for the tendency towards adrenal exhaustion, and that this leads to defective carbohydrate storage and thus to imperfect fat metabolism and acidosis. So close does he regard the etiological association between the nervous diathesis and acidosis that he does not hesitate to speak of "the child with an inborn tendency to acidosis." On the other hand, Dr. Cameron regards the acidosis as producing and exaggerating the nervous symptoms, and the list of troubles which, in his opinion, owe their development or appearance to latent or declared acidosis is indeed a long one. Bouts of vomiting, attacks of mucous diarrhoea, exacerbations of nervous habits, periods of languor and exhaustion, are, perhaps, easily attributable to acidosis, but Dr. Cameron would go further. He suggests that asthma may be closely connected with acidosis, and that the time of its occurrence corresponds with a positive wave of that condition. He is inclined also to attribute to latent acidosis the muscular atony of some nervous children, and thus to include such complaints as flat-foot and greenstick fractures within the syndrome of symptoms. The treatment to be based on this theory of latent acidosis consists in the administration of carbohydrate, most advantageously given in the form of glucose, the regular use of alkaline drinks, and the limitation of the intake of fat. For this line of treatment Dr. Cameron claims considerable success, both in the prevention and the relief of nervous symptoms in children.

Such, then, is Dr. Cameron's conception of the problem of the nervous child. Reduced to its lowest terms it consists of three parts. First, there is presupposed a nervous diathesis; secondly, this induces a latent or positive toxaemia, if this word be used in a sense sufficiently broad to include the set condition of acidosis; thirdly, this in its turn produces further nervous disturbances. Expressed in such terms it must be admitted that Dr. Cameron's theory has the advantage of simplicity. But experience prompts us to wonder whether any simplification, however attractive, will loosen all the knots in the tangle.

Others have written on the question of the nervous child, and for the most part, like Dr. Cameron himself, they have been conscious of two etiological factors—one psychological and the other toxic. In a memorable lecture on the problem of the "solitary child" Dr. Robert Hutchison sketched the psychological effects upon these children of their isolation and the overbearing anxiety of their parents. He was dealing with selected children, but, as we understand his view, he held that the psychological atmosphere of the "solitary child's" home life was too unhealthy for its nervous system, and so originated nervous symptoms. Here the psychological factor is all-important, the diathesis of secondary importance, and the toxic factor absent or at least non-essential. Then at the Bath Conference on Rheumatic Disorders last May Professor C. Vining spoke of the "pre-rheumatic" child, describing once more the type of patient whom Dr. Cameron speaks of as the "nervous child." Here were emphasized the nervous diathesis and rheumatic toxaemia as the two factors at work. Not long ago in our columns Dr. Reginald Miller[1] brought forward what he called the "intestinal child," the child rendered ill by alimentary toxaemia. He, too, wrote of the nervous child, and, indeed, definitely claimed many of the so-called "nervous" children as belonging to this group. Here the toxaemic element is stressed as all-important, the nervous diathesis being a factor, though not an essential factor, in the production of nervous symptoms. Quite recently we published a paper by Dr. A. A. Osman,[2] who takes very much the same line as Dr. Cameron in attributing the symptoms to acidosis, but says that as many as 30 per cent. of hospital children over the age of 2 years suffer from acidosis and cyclical vomiting. Lastly, there are the claims of psycho-analysis to provide an explanation in terms of repression and the "dynamic unconscious."

We see, therefore, that there is considerable disagreement as to whether underlying the nervous instability of children the essential factors are physical or mental. Furthermore, even among those who agree about the etiological significance of toxaemic states there is great diversity of opinion as soon as the actual nature of the toxaemia comes under discussion. It is from considerations such as these that we are constrained to wonder whether Dr. Cameron's simple explanation, with its exclusive reliance on acidosis as the main underlying factor, will be found to cover all the aspects of this complicated problem.

[1] *British Medical Journal*, March 10th, 1928, p. 383.
[2] Ibid., January 26th, 1929, p. 150.

PLAGUE AS AN INTERNATIONAL PROBLEM.

THE International Health Office (Paris) regards the international control of plague as one of its main functions. To keep abreast of modern knowledge of the numerous rodents and fleas which play a part in spreading this disease among men and animals it has arranged for the compilation of a series of reports, and has published these in book form.[1] The matter no longer relates only to the rat and its particular flea, *Xenopsylla cheopis*, and this inquiry has enabled the International Committee to prepare a useful directory of the rodents and fleas incriminated in various parts of the world. In the first paper Professor Ricardo Jorge of Portugal sums up the available information. There is an initial difficulty in the nomenclature of the subject, for the term " rodent " is in common use for all the animals which form a reservoir of plague; many species included in the natural order of that name play no part in the dissemination of the disease, and not a few outside it are as culpable as the rat. There is, moreover, little unanimity in the application of generic and specific names to those animals known to suffer plague epizootics and those fleas agreed to be transmitters.

The rodents of importance internationally are *Rattus rattus*, the black rat, and *Rattus norvegicus*, commonly called the brown rat. Jorge uses the generic name *Epimys*, which is unfamiliar in Britain, and he comments on the confusion which arises from the use of the adjectives of colour to indicate species. Sometimes the black and brown rats are called brown and grey respectively, and there are, in fact, " black " rats which are brown, " brown " ones which are black, and grey rats of both species. An interesting note on the history of the replacement in Europe of *rattus* by *norvegicus* disposes of the idea originally held that it was this change which determined the disappearance of devastating plague epidemics in that continent and in England. Plague had ceased to be a public scourge in these places long before the native rat had been driven out by the invading brown rat. Jorge attributes the change in plague prevalence to the natural variations in incidence exhibited by many diseases, and to the general hygienic improvements which have accompanied civilization, but he draws attention to the theory of Hirst (Ceylon) that the altered distribution of plague outbreaks is correlated with a changed geographical distribution of the flea *Xenopsylla cheopis*. Nowadays *norvegicus* predominates in Europe, but *rattus* is numerically superior in Africa and Asia, forming 98 per cent. of the rat population of India. In Egypt *alexandrinus* (a subspecies of *rattus*) occurs with the brown rat, which, by taking advantage of shipping, has made its way up the Nile. Palestine has the black rat, except in the ports, but the brown has achieved supremacy in Algeria, Tunisia, Mauritius, Iraq, and the Straits Settlements, and is in the ascendant at Bombay, Hong-Kong, Japan, and Dakar, while the black is in excess in Ceylon. In Australia *rattus* exceeds *norvegicus* by 40 to 1. There are signs that the black rat is again increasing in some of the areas of Europe where formerly it prevailed.

Spermophiles (small marmots, many species of the genus *Citellus*) form the animal host in the steppes of south-east Russia, and Jorge comments on the curious fact that in this area mice, though abundant, do not act as plague carriers. In southern Russia, however, both field and house mice form the chief source of human plague, though nowhere else have house mice been convicted of playing such a part. Three papers from Russia,[2] published since the report under review, suggest that perhaps some of the conditions described there as plague in man and in animals may have been tularaemia. It has never seemed likely that tularaemia was limited to North America; its occurrence in Japan seems to have been confirmed, and the Russians now describe certain plague-like conditions which may, indeed, be tularaemia. The water-rat, *Arvicola amphibius*, is particularly concerned. South Africa has special problems of its own, with a large number of wild animals naturally infected, among them the gerbille, from which infection is acquired by the multimammate mouse (*Mus coucha*), which in turn, in its visits to human habitations, passes the disease to man. In Manchuria and much of north-eastern Asia the fur-bearing marmot is the animal which keeps plague always alive, while ground squirrels have been shown to suffer from chronic plague in North America.

The reports collected here leave little doubt that chief importance as a transmitting agent has been rightly attached to the rat-flea *Xenopsylla cheopis*, but the vexed question of the part played by *X. astia* still remains unsettled. Hirst's work in Ceylon would seem to acquit *astia* of serious harm, but Graham and Mital, reporting here from India, give data which are difficult to reconcile with innocence of that flea. The report from the United States of America describes the calculation of an index of epidemicity. Some reserve is expressed regarding the reliance which can properly be placed on such numerical representations of the probable behaviour of a disease, but if such indices are to have any importance at all they must be founded on better and more numerous data than some flea-occurrence figures which were recently thought worthy of publication in the official U.S.A. *Public Health Reports*.

Colonel Forster contributes a paper on the forecasting of plague epidemics in India, in which plague occurrence and mortality are studied in relation to weather conditions. Such attempts at prophecy have lately been much in vogue in India, and it is perhaps legitimate to invite publication of these forecasts so that the value of the work may be put to the test. The reports submitted by the countries where plague is still a menace are very full for the most part, and represent a valuable addition to the literature of the subject. Roubaud contributes a chapter giving a systematic description of the main types of fleas of rodents, and the book ends with a useful alphabetical list of the animals—true rodents and others—which are known to be reservoirs of plague virus.

[1] *Les Faunes Régionales des Rongeurs et des Puces dans leurs Rapports avec la Peste.* Résultats de l'enquête du Comité Permanent de l'Office International d'Hygiène Publique, 1924-1927. Rapporteur: M. le Professeur Ricardo Jorge. Etude Systématique Descriptive des Puces des Rongeurs Transmittant la Peste. Par E. Roubaud. Paris: Masson et Cie. 1928. (6½ × 10, pp. 306; 7 figures, 10 plates. 30 fr.)

[2] *Rev. Microbiol. et Epidémiol.*, 1928, v. 7, English and French Summaries, pp. 340-344 (in Russian, pp. 289, 299, 301).

THE TRAFFIC IN DANGEROUS DRUGS.

EVER since the International Opium Convention of 1912 was signed at The Hague attention has been called in these columns to the enormous excess of production of drugs of addiction, such as opium, morphine and its derivatives, and cocaine, over any conceivable medical requirements. The effect of this surplusage in providing for illicit traffic, at huge profits, and the prostitution of these drugs to vicious and criminal purposes, has been reiterated. We welcomed the cessation of the export of Indian opium to China, and questioned the consistency of continuing the

preparation and export of prepared opium (for smoking) to the Far East by the Government of India. We accepted the Dangerous Drugs Acts of 1920 to 1923 as carrying out for this country the legislation implied by the terms of The Hague Opium Convention, and have urged that similar legislation should be introduced and made operative by all other signatory powers. We have suggested that some practicable measures should be devised for controlling *at the source* the production and manufacture of these dangerous drugs, as well as for the control and supervision of traffic therein, whether national or international. We have noted with regret that in China, at a time when opium production for a period appeared to be coming to an end, the outbreak of civil war in that vast territory should have been accompanied by a great recrudescence of the cultivation of the poppy. We have also from time to time called attention to the way in which China has been literally drenched with morphine and cocaine exported from European countries. Singularly complete exemplification and justification of the foregoing contentions have been furnished by the latest disclosures of the Opium Advisory Committee of the League of Nations. It appears that the Dutch Government has unearthed a factory in Holland which imported huge quantities of morphine, heroin, and cocaine from Switzerland, and purveyed them, chiefly through Viennese agents, to the Far East, the bulk being consigned to China. The amounts of the drugs handled by the Dutch firm—now happily suppressed—were stated to be 35,600 ounces of morphine, 113,000 ounces of heroin, and 3,250 ounces of cocaine. Mr. Sato, the Japanese delegate, shrewdly remarked that "it was impossible to deny the justice of the Chinese demand that the flood of morphine and heroin into China should be considered at the same time as the flood of opium out of that country." It is difficult to understand how this huge illicit traffic got through the meshes of the import and export certificate scheme devised by the Opium Advisory Committee. The new permanent Central Control Board, which has at length been set up under the Geneva Convention of 1925, will have its work cut out for it. In view of these new disclosures it is perhaps to be regretted that, as stated by the president of the conference which gave birth to that Convention, "the American principle for a limitation of production to medical and scientific purposes has not been included as a contractual obligation."

GLANDERS AND MELIOIDOSIS.

ALTHOUGH for some years glanders has been absent from this country, and is everywhere receding before the advance of civilization, it is still of sufficient importance in medicine to have formed the subject of a joint discussion between the Tropical and Comparative Medicine Sections of the Royal Society of Medicine on January 23rd. Until recently, of course, the disease was no uncommon one in Britain: less than twenty years ago there were about 1,800 equine cases in London each year, and about four human deaths in the country generally. Its eradication has been due mainly to the intelligent use of mallein, one of the few really reliable diagnostic agents in the service of man. This disappearance of the disease in temperate climates has rendered its bacteriological study more difficult, and modern workers find that there are many deficiencies in our knowledge of glanders and kindred diseases. *Bacillus mallei* is not now regarded as a single well-defined type, but as a member of a group of organisms, some of which, notably *B. whitmori*, the cause of melioidosis, have been differentiated on various grounds from the type. The distribution of the various serological races has still to be worked out, however. True glanders, due to *B. mallei*, is essentially an equine disease; cattle, pigs, rats, and mice appear to be naturally immune. Closely related to glanders, and apparently limited to Burma, the Malay States, Ceylon, and Indo-China, is a peculiar condition called by its discoverers, Drs. Stanton and Fletcher, melioidosis. This is primarily a disease of rodents, and it is always fatal to guinea-pigs, rats, and mice, as well as to carnivores. The horse and the pig, on the other hand, are very resistant, and only suffer from localized infections at the site of inoculation. Small ruminants and monkeys are susceptible, as also are human beings. In man, as Dr. Fletcher explained at the meeting, the result is generally fatal. He estimates that about two hundred human cases occur annually in the Malay States, but these are often wrongly diagnosed owing to the bewildering variety of symptoms produced—it has been mistaken for malaria, cholera, acute mania, plague, enteric, dysentery, tuberculosis, bronchitis, and pneumonia, among other conditions. The essential lesion, as in glanders, is a minute characteristic nodule which may caseate (in the lungs) or suppurate (in the liver). The organism, closely related to *B. mallei*, may be distinguished from it by being actively motile in young cultures, by its profuse growth on ordinary media, and by its characteristic growth on glycerin agar. The other diseases of the horse which clinically may resemble glanders—such as epizootic lymphangitis, ulcerative cellulitis, strangles, and so on—are of little importance to the clinician, and with the exception of the first-named are not transmissible to man. All can be easily distinguished from true glanders by means of mallein. This agent, prepared from the bacillus in a manner analogous to tuberculin, is, rightly used, considered to be 100 per cent. effective, and its continued use by veterinary surgeons will maintain our freedom from one of the most painful and fatal diseases which can affect man. Few human patients recover from it, and fewer still are in a position to describe it accurately, as did Professor Gaiger at the joint meeting mentioned. He contracted the disease in India many years ago, and it was only after eighty-two operations, during one of which an arm was amputated, that he completely recovered. Since then, however, attempts have been made to find a curative serum—vaccines are obviously useless in an acute generalized condition such as this—and recently one such has been prepared in Canada by injecting horses with mallein. It has been used on a few human cases with good results. Fortunately glanders is now very uncommon, and the use of this remedy is seldom required; but a similar serum prepared from *B. whitmori* would not be without interest in the treatment of the relatively much more common melioidosis in the Middle East.

TREATMENT OF RINGWORM OF THE SCALP BY THALLIUM.

THE remarkable property possessed by thallium, even when employed in quite moderate doses, of causing total though temporary alopecia, has long been known, and has proved an insuperable objection to the use of that metal in medicine, notwithstanding its value in the treatment of certain gastric conditions and in controlling the night sweats of phthisis. But Sabouraud, apparently at about the beginning of the century, although he did not publish the results of his tentative efforts until 1910, recognized that through this very property thallium might prove to be effective in the treatment of ringworm of the scalp. By means of thallium he actually cured several cases, but was deterred from its further use by the serious toxic phenomena which occasionally supervened. Subsequently, as we all know, he developed the *x*-ray treatment of ringworm with such success that thallium once more fell into obscurity. Dr. J. G. Urueña,[1] while admitting Sabouraud's priority, claims for Mexico the distinction of being the first nation to *systematize* the use of thallium for the

[1] *Le Traitement des Teignes par l'Acetate de Thallium.* By Dr. J. G. Urueña. 1928. Masson, Paris.

treatment of ringworm of the scalp. In 1918, owing to the shortage of *x*-ray tubes caused by the war, the Mexican authorities, harassed by the prevalence of ringworm and favus among their population, were compelled to seek some other method of treatment, and fell back on thallium acetate, and it appears that Professor R. E. Cicero, then in medical charge of a ringworm school, was the first to employ it as a routine method of treating both ringworm and favus. His preliminary results were communicated to the Academy of Medicine of Mexico on March 5th, 1918. At first he employed a dose of 5 mg. per kilo of body weight; this, however, was found to be too small to obtain a satisfactory epilation with certainty, and subsequently the dose was increased to 8 mg. per kilo, an amount which was found to give good results without risk of serious toxic complications. Since then this method of treating ringworm has been in constant use in Mexico, and has also been introduced into Europe with success. British dermatologists, however, do not seem to think so highly of it as some of their American and Continental colleagues. Perhaps the explanation lies in the fact that, as Dr. Urueña himself states, thallium is not so successful in cases of microsporon ringworm—by far the commonest type in this country—as it is in the various sorts of large-spored ringworm which form the majority of cases elsewhere. In this country, we think, the principal field for the employment of thallium is in children too young to be submitted to *x* rays. In older children there is a greater likelihood of serious toxic effects; in fact, there is a maximal dose for any patient, however heavy, of 0.3 gram of thallium acetate, which is almost invariably sufficient to produce a satisfactory defluvium of the head but not of the body.

THE CAMPAIGN AGAINST RHEUMATISM.

THE January number of *The Cripple*, which has recently appeared, is the second issue to be made since this periodical adopted both a new name and a new editorial policy. An account of these developments and of the main features of this change was given in the *British Medical Journal* of November 10th, 1928 (p. 859), and we commented on the practical advantages which the broader basis and wider outlook would secure. The current issue of *The Cripple* marks another forward step in this respect. Mr. R. H. P. Orde, director of the Central Bureau of Hospital Information, contributes a lucid and stimulating article on the development of the campaign against rheumatism and the part played in it by the British Red Cross Society. He traces the growth of this campaign since the Ministry of Health, in 1922, undertook the investigation of the incidence of rheumatic diseases; this revealed the magnitude of the question for the first time, and led to the successful appeal by the Red Cross Society for £40,000 for the establishment of a central clinic for physical treatment in London; the clinic will, it is expected, be opened in the middle of the current year. This is admittedly only one stage in the campaign, and attention is now being paid to future developments. Mr. Orde remarks that a central clinic cannot work in isolation, but must be associated with numerous other organizations for treatment and research. Moreover, central clinics cannot be multiplied indefinitely; their high cost alone makes this impossible. It is suggested, however, that in many cases one or two visits to a central clinic may be sufficient to ascertain the nature of the complaint and to indicate the necessary treatment; in some instances this may be available only at the central clinic, but in others—possibly a considerable proportion of the whole—effective therapeutic procedures may be made available at smaller clinics, of which already there are sufficient to demonstrate their value. Some are orthopaedic clinics associated with definite orthopaedic schemes, and others are Red Cross clinics undertaking a certain amount of orthopaedic work and treating other conditions largely of a rheumatic character. There are in the London area to-day four clinics of this latter type. Mr. Orde describes the methods of work and constitution of such units, and, in conclusion, outlines his conception of the form which the campaign against rheumatism should take. He proposes that it should be based upon central clinics, which should be situated where advantage may be taken of existing treatment facilities, in association, for example, with spas, voluntary hospitals, or municipal establishments. Where facilities do not exist, and there is a real need, the establishment of *ad hoc* clinics should be the task of the Red Cross Society. Associated with the central clinics there should be auxiliary clinics, developed from existing institutions where possible, or formed for the purpose, carrying out the simpler forms of treatment. Each Red Cross area might constitute an independent unit, thus permitting elasticity in organization, but Mr. Orde thinks that the formation of a central fund to supplement local efforts would be desirable at the beginning. It is thought that such a scheme offers a practicable method of providing for the treatment of rheumatism within the limits of the voluntary system; its efficacy can be determined finally, of course, only by the test of experience. Within the organization proposed it would certainly be possible to utilize the existing machinery to the best advantage. As in so many other similar problems, the main difficulties likely to be met are in connexion with finance; one of these arises from the fact that in many of the areas where the need is greatest industrial depression has made the raising of funds for voluntary effort least easy. Probably in such cases special contributions from the national fund proposed by Mr. Orde would be available. His scheme is certainly worthy of careful consideration. The remainder of the matter in *The Cripple* maintains the high standard of the previous number. Dr. P. C. Varrier-Jones continues his articles on village settlements, based upon his experience at Papworth; Herr Hans Wurtz offers a notable contribution to the education of the cripple, dealing largely with his mental rehabilitation and social adjustment; and the editor, Mr. Frederick Watson, discusses "Education for prevention of disease." A considerable amount of space is devoted to the training of cripples, with a survey of the present position in England, Germany, and Denmark, and notes on particular problems and on the work of various institutions.

THE FUTURE OF LOCAL GOVERNMENT IN LONDON.

THE London Council of Social Service in 1925 appointed a public health and public assistance committee to consider the proposed changes in local government which have now been embodied in the Local Government Bill, 1928, now before Parliament. This committee, which contained a majority of medical members, and had as its chairman Sir Arthur Newsholme, prepared a preliminary report early in 1926, and on the formulation of the Government's scheme last year resumed its consideration of the measures proposed, dividing this work between two subcommittees, dealing with public health and public assistance respectively. The views of the committee, which have now been published in pamphlet form,[1] deserve the attention of all who are concerned with the problems arising in the application of the Local Government Bill to London. This publication, indeed, should prove interesting to many who are not even remotely concerned with affairs in London, for it provides in summary form a suggestive study of the current tendencies in local government in general. The committee's observations on the actual provisions of the bill are of interest, but remembering the progress which the measure has already made in Parliament under a time-table, and that it appears likely to become law without substantial amendment, we may confine ourselves to the

[1] London Council of Social Service, 1, Express Mansions, N.W.3 (price 6d.).

views expressed upon the future development of local government in London. It will be remembered that the bill requires the London County Council—in common with other authorities of equal status—to prepare a scheme of administration providing for the discharge of its new duties. The committee calls for a realistic study of the question, remarking: "It is incumbent upon Londoners to consider according to each man's measure of experience and imagination, not an ideal system of public health and public assistance, but a system as near to that as the confused disorder of local government with its accumulated friction, jealousies, ambitions, and aspirations may allow the County Council to achieve." It is suggested that opportunity should be taken to link the chief branches of local administration—those concerned with health, education, and public assistance—into one organic whole. Space does not permit us to elaborate this thesis, but it is significant to note that the committee favours a high degree of unification in health services. The staffing arrangements of the London Education Committee are held up as a model for all counties, and the view is expressed that those of the new Public Assistance Committee might gain a similar standing if they were widened to include the part-time services of borough medical officers, who until now have held isolated positions in which their spheres of work—especially in relation to school medical services on the one hand and maternity and child welfare on the other—have been cut off from the main stream of public health services in London. It is regarded as anomalous that vaccination should be transferred to the borough councils while the functions of the Metropolitan Asylums Board, "virtually the authority for the treatment of small-pox," should go to the County Council. The committee considers that the public health and public assistance committees should be constituted by the County Council on the lines of the existing Education Committee, with a minority of co-opted members appointed by the Council on the nomination of social workers. Reference is made to the great amount of work done by voluntary associations, often administered by representatives of professional and other organizations of the type of the British Medical Association, and it is suggested that nominations might be received from such bodies. The medical subcommittee which discussed the bill welcomes the provision permitting the unification of health and assistance services under one authority, and regards as essential to the full realization of the reforms the reference by the County Council to its Public Health Committee of all medical functions transferred from the guardians. It is thought, however, that the grants for maternity and child welfare, for tuberculosis, and for venereal diseases should remain on a percentage basis instead of being replaced by the block grant. Great importance is attached to the assimilation under unified but decentralized arrangements of the various health officials now employed, and to the co-ordination of their work with that of the voluntary agencies, while the need for co-operation with the private practitioner is emphasized.

THE JOURNAL OF NUTRITION.

THE birth of new scientific journals, though often necessary, cannot be regarded as an unmixed blessing. Justification for specialized journals, like specialized departments, is found in the growing volume of scientific work; there is, however, the risk that an increase in output may be accompanied by a decline in the standard of work published. It is already difficult enough for those engaged in research work to maintain effective touch with recent developments in even one branch of scientific activity, and the publication of large amounts of indifferent work would make their task impossible. We may none the less welcome the appearance of the *Journal of Nutrition*,[1] a bi-monthly periodical published for the American Institute of Nutrition. Nutritional problems excite even more interest in the United States than they do in Europe, and clearly the journals devoted more generally to biochemical research are in danger of becoming overburdened. These problems, too, require somewhat specialized technique, and some of them are not necessarily of immediate interest to any but a rather limited group of workers. And finally, the names of Professors Lusk, McCallum, Dubois, and Mendel on the editorial board of the new journal should assure us that it will prove a valuable medium for the publication of original research work. On all these counts the *Journal of Nutrition* may be regarded as fulfilling an important need. The first number contains papers by several prominent American workers in the field of dietetics, and is noteworthy for its editorial review.

[1] Annual subscription, price 21s., post free. Sole European agents: Messrs. Baillière, Tindall and Cox.

AN OPHTHALMOLOGICAL SERVICE.

WE publish in the *Supplement* this week at page 29 an article describing the provision of ophthalmic treatment on the clinic system, in accordance with a scheme drawn up jointly by the British Medical Association and the Association of Dispensing Opticians. This scheme is intended to give insured persons, their dependants, and others of a like economic status certain definite advantages not hitherto enjoyed by them. The underlying principle, stated briefly, is to ensure that such persons may have their eyes examined and spectacles supplied at a moderate cost. In this way the British Medical Association is endeavouring to fulfil the undertaking it gave last year to a Departmental Committee to arrange for an adequate ophthalmic service all through the country on terms which people of limited means can afford.

WE regret to announce the death, on January 27th, in his eighty-second year, of Dr. F. de Havilland Hall, consulting physician to the Westminster Hospital; an obituary notice will appear in our next issue. We have also to record the death, on January 28th, at the age of 65, of Mr. Victor G. Plarr, M.A., librarian of the Royal College of Surgeons of England, who was a valued occasional contributor to our columns.

THE KING'S ILLNESS.

WE learn on the best authority that His Majesty during the past few days has continued to make slow but steady progress towards convalescence, and that nothing has intervened to disturb the provisional plans for his removal to Bognor in the near future. Recent bacteriological tests confirm the clinical evidence that the right chest is now free from infection. The temperature has settled down, the pulse remains quiet, sleep is better, and solid food can be taken in larger amounts. Thus the gratifying improvement recorded last week has been maintained, and we may look for further news, from time to time, of advances along the uphill road to recovery. Our profession and the nursing profession have every right to feel proud of the success so far achieved by those to whom the care of the King's life and health has been entrusted. Their skill and devotion, under wise leadership, have had full scope throughout, and for this the nation owes a great debt to the Queen, whose courage has been an example to her people. It was fitting that the first public message from the King since he fell ill should have been given by Her Majesty at a hospital gathering: "His illness has brought him to appreciate more deeply than ever before the value of medical science and of devoted nursing."

MEDICAL EDUCATION OF WOMEN.

REPORT OF THE UNIVERSITY OF LONDON COMMITTEE.

THE report of the committee appointed by the Senate of the University of London in March last year "to consider the question of the limitations placed upon the medical education of women undergraduates and to report . . . thereon" was presented to the Senate in private last week and published on Saturday. The committee pronounced itself unable to find any valid argument, on the merits of the question, against the provision of co-education in medicine, which was regarded as the main point at issue, but emphasized the view that co-education to succeed must be voluntary. It recommended that copies of the report be forwarded to the schools in the Faculty of Medicine, and that the schools be invited, where they do not now do so, to consider the possibility of admitting a quota of women students. The Senate has given its general approval to the report, which does not bind that body to every word in it, and has accepted the tentative course of action proposed. A secondary point which may be indicated at this stage is that the question at issue relates to facilities for clinical education; the report reviews the nature of the medical curriculum as a whole, and points out that the facilities for pre-clinical instruction of women are ample, adding, however, that the fact that there may be difficulty in finding clinical facilities at a later stage must inevitably affect the number of entrants for pre-clinical courses.

Composition of the Committee.

The committee consisted of persons representing a wide range of interests. The then Vice-Chancellor, Sir William Beveridge, and the Chairman of Convocation, Professor Loney, were members *ex officio*, the remaining members being Dr. Graham Little, M.P., chairman of the Council for External Students, Sir Holburt Waring, F.R.C.S., chairman of the Finance Committee, Dr. Halliday, principal of King's College, Dr. Matthews, dean of King's College, Mr. Walter Spencer, F.R.C.S., vice-president of Westminster Hospital, Miss Strudwick, principal of St. Paul's School for Girls, Sir Andrew Taylor, representing University College, and Miss Tuke, principal of Bedford College. Sir Gregory Foster, principal of University College, and now Vice-Chancellor of the University, was afterwards added. Sir William Beveridge was chairman of the committee throughout its existence. Eleven meetings were held, at some of which representatives of certain medical schools and of other bodies, including the Medical Women's Federation, were interviewed. The chairman of the committee also attended a meeting consisting of representatives of all the medical schools. Much statistical information was supplied by the schools and by bodies such as the General Medical Council and the University Grants Committee.

After outlining the nature of the medical curriculum, as mentioned above, the report surveys the facilities for medical education in London and presents a review of the changing character of the extent to which the various institutions have admitted women students, which may be summarized as follows:

Of the twelve medical schools in London affording clinical instruction, none, before the war, admitted women, except the London School of Medicine for Women (Royal Free Hospital), which was founded for women only, and remains restricted to women. In 1916 St. Mary's Hospital, St. George's Hospital, and Charing Cross Hospital undertook to receive women for clinical studies. In 1917 Westminster Hospital, and in 1918 the London Hospital, King's College Hospital, and University College Hospital resolved to admit women, the last hospital named restricting the number to twelve a year in 1921. In 1919 St. George's Hospital, in 1921 the London Hospital, and in 1924 St. Mary's Hospital decided to admit no more women students. In 1928 Charing Cross, Westminster, and King's College Hospitals announced their intention of discontinuing the admission of women students in the future.

By July, 1918, of the twelve schools, four (the larger institutions) were confined to men, one was confined to women, and seven were open to both sexes. The effect of recent changes of policy is that there are now two schools only which offer clinical facilities to women—the London School of Medicine for Women, and University College Hospital Medical School which admits twelve women a year.

An Earlier Inquiry.

Reference is then made to the proceedings of a subcommittee of the Academic Council which was appointed in December, 1915, to consider whether the then existing facilities for the medical education of women in London were adequate, and, if not adequate, to suggest what means should be adopted to extend them. The members of this subcommittee in their report, formulated after prolonged consideration and discussion with the parties interested, expressed the following opinion on the general question before them:

"We are of opinion that no valid objection can be maintained against the system of co-education for men and women medical students; and that this is the only system by which the general policy of the university can be effectively carried out. In our opinion adequate facilities for the medical education of women would not be provided in any hospital or medical school unless resident medical and surgical appointments were open to men and women on equal terms."

The report was transmitted by the Academic Council to the Senate, and subsequently communicated to the medical schools. As a result a conference with representatives of the schools was held in January, 1917, when a considerable divergence of opinion was disclosed; on receiving the report of this conference the Senate decided to abstain from taking action in the matter. In the meantime, the opening of various schools to women during the war had for the time being relieved the situation. When the question again rose in 1921 on the decision of the London Hospital Medical College to restrict admission to men, another subcommittee of the Academic Council expressed the view that there was no lack of clinical facilities for women, and that no further action was advisable.

The Question of Numbers.

Having thus surveyed the question in its historical aspects, the report proceeds to the examination of the nature of the problem before it. Two aspects are recognized—that of providing clinical facilities adequate for the number of women requiring them, and that of providing such facilities in schools open to both sexes.

"In its first aspect," the report states, "the problem is a comparatively simple one. The great increase during the war in the number of women taking up medical studies has been followed by a striking decrease. On the evidence of Part II of the Second Medical Examination, as marking the passage from pre-clinical to clinical studies, in 1918 the number of women in London substantially exceeded that of the men; in 1919 the numbers were practically equal; from 1920, whereas men have maintained or increased their numbers, the women have fallen to less than a half. In the London School of Medicine for Women the total number of students, from 193 just before the war, rose to 459 in 1920–21 and fell to 298 in 1926–27. Outside London the fall in the numbers of women medical students has been even more marked."

The committee thinks it would be unwise to assume, however, that the figures of women entrants will remain at their present low level.

"There appear to be already indications of a revival," the report continues, "and though the policy of exclusion may for a time result in a number of women seeking admission to medical schools in the provinces and elsewhere, they will not, and in our view they should not, consent to being excluded from participation in medical education in the metropolis."

The committee is of the opinion that, taking all things into consideration, the provision of a hundred clinical places for women, apart from those available at the London

School of Medicine for Women, would be ample for the next few years. It holds, however, that the numerical side of the problem is the least important one. The real issue is as to the maintenance in London on a substantial scale of facilities for medical co-education at the clinical stage. The committee states:

"In all its other large faculties—for example, in Arts, Science, Economics, Laws—the University of London is predominantly co-educational; actually, though it has a few colleges confined to women, it has none in these faculties confined to men. The prepossession of the University of London has on more than one occasion been expressed to be in favour of a measure of co-education also in the great Faculty of Medicine," and asks: "Is there any feature peculiar to medical studies making co-education, which predominates in the rest of the university, undesirable in that one field?"

Objections to Co-education.

The report proceeds:

"We can say at once that we are satisfied that the relationship existing between men and women students of medicine is not of itself an objection to co-education, and we are glad to say that none of the representatives of schools who had had actual experience of women students alleged any case of difficulty or the need of disciplinary action arising out of this relation; uniformly the conduct of the women was described as excellent.

"In this respect our own conclusions agree with those arrived at by the inspector appointed by the Senate, the late Dr. J. George Adami, in his report on the medical schools. The report stated: 'The reports of the deans of the co-education schools regarding the work and attitude of the women students were uniformly favourable. The dean of one school bore evidence to the improved tone of the men students since women were admitted. The deans of two schools gave it as their impression that as the result of co-education the women students of their schools were more womanly and more considerate in their dealings with hospital patients than women trained apart from men.'"

The committee examined objections taken to co-education—such as the necessity for providing special accommodation (residential and other) for a mixed staff; the difficulty of teaching mixed classes in some subjects; the tendency of women to crowd to the front at demonstrations; and the difficulty in the way of reproving a person of one sex in the presence of persons of the opposite sex—and concluded:

"We think there must be some force in these objections, but . . . they have not been felt to be insuperable by schools with actual experience of co-education, and in fact they appear to us capable of adjustment with no more difficulty than most co-educational problems.

"Nor," the report continues, "are we impressed by the argument that the medical education of women is to a great extent thrown away by the 'wastage' that occurs, owing to marriage and other reasons which result in women leaving the medical profession after undergoing the expense and difficulty of qualification. As a matter of fact, it would appear from the information before us that the 'wastage' is much less considerable than is sometimes supposed. In so far as it has any weight, the argument tells not against co-education in medicine, but against any medical education of women at all. In London it certainly cannot be used as an argument for curtailing the facilities for women, for, in the aggregate, the number of places vacant is certainly greater than the number of applicants who could fill them.

"On the other hand, we think it is clear that in medicine women certainly gain by being educated side by side with men, and that such an education is a very valuable training for that co-operation which in their subsequent careers becomes necessary between medical men and women. It may be that the advantage is not felt so much by men students, and indeed co-education for some men may not be profitable. On the balance, however, we think that the advantage to the women outweighs any possible loss to the men."

Competition Among Medical Schools.

"We do not suggest, however, that there are no difficulties in the way of medical co-education in London. They are not the difficulties we have already referred to. The real difficulties arise from (*a*) the multiplicity of medical schools and their competition for students, and (*b*) the feeling against co-education entertained by some of the men already in the medical profession, some of the men students, and a section of the public. With few exceptions the authorities of the medical schools appear to be convinced that men, if they have a choice, prefer to go to schools which do not admit women, and that the feeling is strongest among the men, and in some cases the parents of the men, who on general grounds would be most desirable. Since there are now certainly not enough students to fill all the schools, this means, if some schools admit while others exclude women, that co-education is in unstable equilibrium: and that the school which admits any women will have a disappearing number of men.

"This feeling of antipathy may be deplored, but we have no doubt as to its existence, and since the medical schools are dependent to a very considerable extent on the income derived from students' fees, it is only natural that the authorities of the schools should be concerned with the economic problem to which it gives rise. In one of the cases at least in which a genuine attempt was made to provide absolutely fair treatment to women students, it was only the apprehension that the policy of co-education was heading the school for disaster which led to its reversal. How the exclusion of women can in all cases increase the number of men entrants all round is not obvious, for the number of possible entrants is not unlimited; that, however, is a matter on which we need not express an opinion. How long this feeling is likely to endure, and, in particular, whether it would endure indefinitely against the attraction of first-rate teaching and equipment in a co-educational school, are questions which it is difficult to answer."

Conclusions.

In their conclusions the members of the committee state that they are unable to see any valid argument against the provision of co-education in medicine, and that the prepossession of the university is in favour of such co-education.

"The changed public position of women in the past generation," their report proceeds, "is too obvious to need comment. If the field were clear we find it hard to believe that anyone who at the present day was planning afresh medical education in London as a whole would plan it otherwise than on the basis of being, like education in the other faculties, predominantly co-educational. In medicine, as in other fields of study, the services of the schools of the highest prestige and the teachers of the highest distinction should be available to men and women indifferently, and men and women who after their university careers have to work together in so many new relations should learn to do so at the university stage.

"We do not, indeed, wish to suggest that co-education should be universal in the medical schools. Among the consequences which might result from the adoption of such a policy would be that in some schools there would be only a very small number of women—perhaps only one woman. Such a condition of affairs would on various grounds be highly undesirable. There should, in our view, be three types of clinical education: (1) For men only; (2) for women only; and (3) for men and women. This involves the maintenance as men's schools of certain existing schools, the maintenance of at least one women's school, such as the London School of Medicine, and the provision of facilities for co-education."

The report takes cognizance, however, of the fact that the existing medical schools came into existence before the university; it is pointed out that some of them have long traditions to which they are naturally strongly attached, and that, having generally originated in the hospital with which they are associated and not having as a rule a separate legal existence, they are even more independent of the university than other schools. Further, a large proportion of their students are working for examinations other than those of the university. It is stated that at present the sole power which the Senate can exercise is to discontinue the recognition of a school as a school of the university, a power which has never been enforced. Under the new statutes, however, the Treasury grant from the University Grants Committee, at present paid direct to the medical schools, will be paid in a lump sum to the university. The committee does not consider that power over grants could or should be used to compel a medical school to remain or to become co-educational against its will. The report concludes:

"Co-education, if it is to succeed, must be voluntary. Before the war the tradition or policy of the medical schools was opposed to co-education, and its introduction during the war was due to the initiative of the schools, though it was welcomed by the university as being in accordance with its own policy. Its restoration can, we are convinced, only come about by an agreement between the university and the schools, and possibly by an arrangement by which the several schools would agree to a certain quota of women students."

Scotland.

Influenza in Scotland.

REFERENCE was made in this column last week to the recent outbreak of influenza and pneumonia in Scotland. The Registrar-General for Scotland reports that during the week ended January 19th deaths from influenza numbered 179, which was 123 more than in the previous week. Of these 179 deaths 151 occurred in Glasgow. The hospital accommodation in that city was greatly strained in dealing with cases of pneumonia, of which 640 were under treatment in the various hospitals of the city at the close of the week. To relieve to some extent a waiting list of 150 patients suffering from this disease a ward had to be specially set aside. The public services suffered severely, for about 250 tramwaymen were off duty largely from this cause, and the police force was reduced by a sick list of 230. In many schools, also, the proportion of absentees amounted to about one-half of the children. In Edinburgh the number of cases of influenza, though it was generally of a mild type, was very large. As a precautionary measure the staffs of the various hospitals received preventive inoculations. An offer was made by the health department of the city to inoculate the staffs of the tramway and other transport services, and this offer was accepted by a large number of the men, over 100 tramway workers having been inoculated by January 25th. In Aberdeen the outbreak has been milder; during December 42 cases of pneumonia were notified to the public health department, and in the first three weeks of January there were respectively 15, 18, and 29 such notifications. Up to January 25th the epidemic in Aberdeen, though of a mild form, had affected the city constabulary, tramway, bus, and post office staffs, as well as those of private offices, to a very considerable extent.

Edinburgh Royal Infirmary.

The committee appointed by the court of contributors of Edinburgh Royal Infirmary to consider the report of the managers (to which reference was made in the *British Medical Journal* of January 12th, at page 80) has drawn attention to several important points in connexion with the management of this hospital. It is pointed out that nearly 20,000 patients were treated in the wards in the past year, and that the number is steadily increasing. Of the cases admitted, 4,326 were medical and 14,466 surgical, whereas twenty years ago the relative figures were 4,104 medical and 6,828 surgical. At that time the average duration of a patient's stay in the Infirmary was 26.4 days, while last year the figure stood at 16.39 days; for surgical cases the average residence was reduced in this period from 23.4 days to 13.46 days. The number of patients from the country outside Edinburgh shows a marked increase; in 1908 patients admitted from the city numbered 6,259, and others 4,716, while in 1928 those from the city numbered 8,815, and from the country 9,964. Attention is drawn to the fact that, while the total number of hospital beds is 1,006, the waiting list on December 31st, 1928, comprised 2,692 cases. It is hoped that during the next year some relief will be gained by the recent addition of two small wards, and by the opening of the Astley Ainslie Institution, which up to the present time has had only 34 beds for female patients. The fund for extension purposes now stands at approximately £21,000, and within the next few years the neighbouring grounds of George Watson's College are to be taken over by the Infirmary. No definite scheme for utilization of this extra space has yet been prepared, but the question of providing accommodation for maternity cases and of building centralized quarters for the nursing staff is receiving consideration. It was also mentioned that the hospital's radium supply had been increased recently by a purchase amounting to £1,648, and that great developments in the treatment of cases by this curative agency might be anticipated from the managers' recent proposal for the establishment of a radium centre in connexion with the Infirmary. The committee made a special appeal for extended support to commemorate the foundation of the hospital two hundred years ago, and to mark the fact that the present year is also the jubilee of the opening of the buildings now in use. In connexion with the proposal for a radium institute under the management of the Royal Infirmary, which was outlined in the *Journal* of January 5th (p. 36), a sum of £5,000 has been offered to the board of management. It is understood that the gift is from two persons who desire to remain anonymous, and who have been induced to make this offer in memory of the spirit of devotion to the interests of suffering humanity exhibited by the two young doctors in London who recently sacrificed their health by overwork, which ultimately led to their tragic breakdown and suicide.

Edinburgh Medical Missionary Society.

The annual general meeting of the Edinburgh Medical Missionary Society was held on January 24th at 117, George Street, Edinburgh, with Mr. C. W. Cathcart, F.R.C.S., in the chair. The financial statement showed that without any abnormal increase of income the year's expenditure had practically been met. Two years ago there was a deficit of £1,422; this was subsequently reduced to £725, and at the end of the year under review the debt to be carried forward was only £67. The usual medical and social work was carried on in the Cowgate district by students and volunteer helpers, and the hospitals of the society abroad had a busy and satisfactory year. The resignation from the post of superintendent and secretary of Dr. Lechmere Taylor was intimated, and Dr. F. O. Lasbrey, superintendent of the Cairo Medical Mission and secretary of the Church Missionary Society in Egypt and the Upper Sudan, was appointed to succeed him. Dr. Taylor, in submitting a survey of his work, said that the society existed for the fundamental object of training men and women for medical missionary service in different parts of the world. He had made an examination of the positions now held by the 79 medical students who had passed through the hands of the society, and he had found that only a very small number of them were not now in active missionary service. A few had fallen out for reasons of health, or of family considerations, but he thought that the great success in training which had been accomplished merited a continued public support of the society's work. The adoption of the report was moved by the Rev. Dr. R. Laws of Livingstonia.

England and Wales.

New Operating Theatres at Leicester Royal Infirmary.

Two new operating theatres, with accessory rooms, equipped on the most modern lines, were opened on January 23rd at Leicester Royal Infirmary by Mr. C. J. Bond, F.R.C.S., consulting surgeon to that institution; his connexion with it has extended over a period of more than fifty years. In the course of the ceremony Mr. Bond briefly reviewed the development of surgical work in the Infirmary. He described a small room in the old central building, with a double door to admit stretchers, a flat skylight in the ceiling, an open fireplace, and candles or gas for light; on one side were some wash-hand basins and, in an adjoining room, a cupboard for instruments, and a row of blood-stained dirty overcoats. It was in this room, he said, that in 1875, when he started as a pupil, and in 1882, when he became house-surgeon, all the more important operations were performed. Mr. Bond recalled the crude apparatus employed in this work and the difficulties which faced the surgeon at that time, and mentioned the introduction of antiseptic surgery and of improvements in inducing anaesthesia. As house-surgeon and the only qualified resident officer he had had charge of both surgical and medical wards, including thirty typhoid beds; he dealt with casualty and emergency cases, and helped with the out-patients; he performed *post-mortem* examinations, and attended inquests and board meetings; and he operated in emergencies in the absence of the surgeon. The speaker recalled the opening of the modern theatres in the Victoria wing of the Infirmary in 1902, and of the important work since carried on in them, and discussed the value of the most recent addition to the institution's resources. Finally, in speaking of the future of surgery and its relation to other forms of treatment such as

radiology, he remarked that something more was required of a surgeon nowadays than mere manual skill; he must possess surgical insight and be able to appreciate what was going on in the patient's system; he must know when to operate and when to refrain; he must understand the natural and physiological methods of defence and be able to reinforce them when necessary.

Transference of Queen Charlotte's Hospital to a New Site.

The Management Committee of Queen Charlotte's Maternity Hospital has announced that the entire hospital, with the nurses' home and post-graduate and students' college, is to be transferred from the present "cramped, noisy, and unsuitable" site in Marylebone Road to a quieter part of London. Negotiations for a suitable situation are in progress, and plans have been prepared for the erection of a new hospital on the most modern lines. It was felt that in its present position the work of the institution could not be adequately developed, and the policy of removal, which has the approval of the Ministry of Health and of King Edward's Hospital Fund, was accordingly adopted. In the course of an official statement which has been issued mention is made of several features of the proposed scheme. The plans provide for the erection of an isolation block for cases of puerperal fever; this, it is believed, will be the first of its kind in this country in a voluntary hospital. Special provision will also be made for research work on puerperal fever, as part of the campaign against the high maternal mortality from it. It may be recalled that such preventive work was foreshadowed nearly two years ago, when an appeal for £250,000 was made by the governing body of the hospital: some comment on it appeared in our columns on May 7th, 1927 (p. 851). Another block in the new building will be reserved for pre-natal cases, which have hitherto suffered from the almost general lack of provision for their particular needs. It is also proposed to set apart a considerable amount of accommodation in the form of comfortable bedrooms for paying patients of moderate means: this provision will be on as large a scale as possible, and will not be regarded merely as an unimportant adjunct to the charity work of the institution. It is believed that this development will do much to encourage the desirable practice in London of providing such accommodation on an equal scale both for the poorer classes and for people of moderate means. The importance of this rests upon the belief that no single movement will do so much to diminish maternal mortality as the reception in hospitals of maternity cases from all classes of the community, because mortality is equally high among rich and poor. The new hospital will be constructed as a number of units, and it is thought that the first of these, the isolation block, may be completed by the spring of next year. Ample room for future expansion will be available.

Middlesex Hospital New Nurses' Home.

The Queen, on January 24th, laid the foundation stone of the new nurses' home of the Middlesex Hospital, which is being erected in Foley Street, on a site adjoining the hospital. When completed the home will provide sleeping, refectory, and recreation accommodation for 450 sisters, nurses, and maids; its construction has been made possible by the generosity of an anonymous donor, who has given £200,000 to the hospital. In the course of the proceedings a message from the King was conveyed by the Queen to Prince Arthur of Connaught to the effect that His Majesty was very pleased that the Queen was laying the foundation stone of the new nurses' home. His illness, it was added, had brought him to appreciate more deeply than ever before the value of medical service and of devoted nursing. Prince Arthur in his speech referred to the Queen's interest in the welfare of the voluntary hospitals and their staffs. At the close of the ceremony Her Majesty visited a number of the wards of the hospital. The Middlesex Hospital motto is *Miseris succurrere disco*, and a new significance attaches to this Virgilian phrase when it is recalled that the whole sentence, which was part of Queen Dido's address to the afflicted Aeneas and his followers, runs: *Non ignara mali, miseris succurrere disco*; this may be rendered, "Not unacquainted myself with trouble, I learn to aid the afflicted."

Correspondence.

TREATMENT OF NON-SPECIFIC DIARRHOEA IN THE TROPICS.

SIR,—In a short article on November 10th, 1928 (p. 843), Dr. C. V. Thornton divides tropical diarrhoea into two main groups. In the first, when a specific cause is demonstrable, he only mentions (1) the dysenteries (which, I presume, are meant to cover amoebic dysentery, the various forms of bacillary dysentery, and probably hill diarrhoea); (2) sprue; (3) tuberculosis; and (4) syphilis. To these, at the end of his article, he adds cholera and food poisoning; he might have included typhoid and paratyphoid fevers. His second group contains diarrhoea not caused by any of these agents.

After working five years in Assam and two years in the Seychelles Islands I feel safe enough in stating that there are comparatively few cases of diarrhoea in the tropics to which definite causes cannot be assigned.

In Assam the condition that gave us most concern was "choleraic diarrhoea," a form of very acute gastro-enteritis which closely resembles cholera clinically, but which is definitely not cholera; it is considered by us as merely a syndrome or set of symptoms common to several diseases of absolutely different agency. After four years' work among tea-garden coolies in Assam we were eventually able to arrange those cases of choleraic diarrhoea in five main groups: (1) cases of acute bacillary dysentery; (2) cases of algid subtertian malaria; (3) cases of mushroom poisoning; (4) cases of food poisoning; (5) cases to which, in the absence of detailed laboratory investigation, no definite cause could be assigned. Preliminary notes by me on the etiology and diagnosis of choleraic diarrhoea were published in the proceedings of the Assam Branch, British Medical Association, 1926.

But apart from choleraic diarrhoea and diarrhoeas due to the specific causes mentioned by Dr. Thornton, may I suggest (seeing that he does not mention them under specific diarrhoeas) that he may have overlooked diarrhoeas caused by intestinal protozoa other than the *Entamoeba histolytica*, and also diarrhoeas caused by certain helminths. While there may even be other such parasites which I have personally not met with, in my experience the following parasites are often responsible for diarrhoea in the tropics: (1) *Balantidium coli*; (2) *Entamoeba coli*; (3) *Giardia intestinalis*; (4) *Trichomonas hominis*; (5) *Chilomastix mesnilii*; (6) *Blastocystis hominis* (a vegetable parasite); (7) *Strongyloides stercoralis*; (8) even ascaris, ankylostoma, and trichiurus, are liable to cause more or less protracted diarrhoeas in children, and in looking for finer causes the presence of these may not be realized. In quite a large number of cases of diarrhoea, varying in degree of severity and in duration, these parasites are invariably found, either singly or associated two or more in the same case.

In the case of protozoal parasites, including *Blastocystis hominis*, stovarsol, in my hands, has proved a specific, and even in the cases of diarrhoea of unknown causation I suggest that stovarsol is worth a trial. Special mention must be made of *Balantidium coli* and *Strongyloides stercoralis* as agents of protracted diarrhoeas. Human balantidiosis is much more common than hitherto realized; it may be responsible for diarrhoea lasting for years and eventually proving fatal. From Assam I reported three cases only discovered towards the end of my time there, and here in Seychelles I have in two years had thirty-five cases under my care. These cases I may state are reported for the first time from these islands, so far as I am aware. In all these cases (one actually of about five years' duration) stovarsol has established a definite cure without relapse after an average course of six days' treatment with it.

Strongyloides stercoralis causes very often a protracted form of diarrhoea, the patient sometimes having as many as fifteen stools in twenty-four hours. It is a parasite extremely difficult to expel, requiring repeated treatment with chenopodium and carbon tetrachloride combined, but their eventual removal invariably puts an end to the diarrhoea.

The liver treatment advised by Dr. Thornton is very interesting, but if the help of the microscope is constantly sought and carefully applied to the investigation of diarrhoeic stools, the application of liver therapy must necessarily become very restricted.—I am, etc.,

L. C. D. HERMITTE, M.B., Ch.B., D.T.M. and H.

Mahe, Seychelles Islands, Dec. 29th, 1928.

PYORRHOEA ALVEOLARIS.

SIR,—In the kind notice you bestowed in your leading article on my remarks about pyorrhoea alveolaris (January 19th, p. 115) you appeared to invite discussion on some points of detail which lack of space compelled me to omit or to treat somewhat briefly in my paper. I certainly recognize the wide difference that separates the soft yellow calculus (liable in many mouths to be deposited from the saliva on all hard surfaces, whether teeth or artificial dentures, which are not cleansed by friction), and the harder, darker, subgingival calculus which is, I believe, the causative agent in pyorrhoea; though obviously the former, by encouraging stagnation, will facilitate the deposit of the latter. But I believe that to regard the blood serum as the sole source of subgingival calculus (it is often styled serumal calculus) is going further than our present knowledge warrants. I therefore used the general term "oral secretion" to cover not only saliva, but mucus and serum as well. Saliva contains mucus, and would appear to be sufficiently viscid to stagnate in the interdental spaces. The point is still *sub judice*, and is not, after all, of great importance.

It is annoying to have the two terms tartar and calculus in common use, but as popular and professional custom appears to regard the two as interchangeable, I have not attempted to distinguish between them.—I am, etc.,

H. F. HUMPHREYS.

Birmingham, Jan. 22nd.

SIR,—In his letter (January 26th, p. 176) Mr. Bertwistle, referring to Mr. Humphreys's article on the above subject, states "I fully endorse his opinion that a negative radiogram means nothing, though a positive one is invaluable. Weston Price goes further, and states that it is just those teeth which present no radiographic evidence of disease which are the worst offenders." I venture to suggest that Mr. Bertwistle has misrepresented the opinions of both these authors. Apart from acute lesions, which are producing symptoms and can usually be detected by a clinical examination, I maintain that the negative evidence in those cases where a clinical examination is negative is most valuable, and that it is rare for the radiographic evidence of teeth producing systemic disease to be negative.

Weston Price estimates that about 10 per cent. of teeth which are septic show no change on the radiograph, but several of the radiographic illustrations he uses to demonstrate this point show definite lesions. On the other hand, radiologists find apical abscesses, sometimes of considerable size,[1] every day in patients complaining of symptoms, attributed by their medical advisers to dental sepsis, whose teeth have been very carefully examined by skilful dental surgeons with negative results.

To my mind the important feature is not the relatively rare case of dental sepsis in which changes are absent to the clinical observer, and the lesion is not shown on the radiograph, but the failure of some dental surgeons to appreciate the danger of lesions which are very obviously shown on the radiograph, because no local clinical signs are present. Sometimes teeth, the radiographs of which show definite septic changes at the apices, are subsequently root-filled—a procedure which is both dangerous and unjustifiable. The excuse that the tooth is "useful" in any sense should not be considered. I have recorded[2] the grave results which have followed this procedure.

Similarly, the wholesale extraction of teeth without clinical or radiographic evidence of sepsis is to be condemned, and though of the opinion that all dead teeth are a potential source of danger to the patient, I hold that, even if a tooth has been root-filled, provided the clinical and radiographic evidence, as far as this tooth is concerned, is negative, it is purely empirical to extract this tooth.—I am, etc.,

JAMES F. BRAILSFORD, M.D.

Birmingham, Jan. 27th.

[1] James F. Brailsford: Observations on the Value of Radiography in the Diagnosis of Obscure Dental Sepsis. *British Medical Journal*, June 16th, 1928.

[2] Idem: Radiological Findings and their Significance in Focal Dental Sepsis. *The Dental Surgeon*, October 13th, 1928.

CARDIOSPASM OR ACHALASIA OF THE CARDIA.

SIR,—Though not desiring to enter the lists in the discussion on the pathogenesis of oesophagectasia, I wish to record observations made in operating on three of these cases. Those who perform the operation of digital stretching of the cardiac orifice do not get the opportunity of observing either the relations of the abdominal oesophagus or the state of the musculature.

I have operated on three cases, referred to me by physicians, by the method described by Mr. R. P. Rowlands. (I do not know if he was the originator of the operation.) All three were well-marked cases, and two of them had received treatment for a considerable period with the mercury tube, which had in both cases become a necessity before each meal. The third case had had a shorter period of treatment, and was operated on only a few months ago.

The details of the operation are as follows: After medium laparotomy the cardiac end of the stomach is drawn down and the peritoneum divided round the oesophagus as it emerges from the diaphragm. A piece of rubber tubing is then passed behind the oesophagus and gentle traction employed. In this way it is quite easy to expose two inches or more of oesophagus. An oesophageal bougie is then passed down the gullet into the stomach, and the circular fibres of the terminal inch or so of the oesophagus are carefully divided right down to the cardiac end, both anteriorly and posteriorly. Great care is taken to avoid injury to the mucosa and to the vagi.

The operation is more simple than it sounds, and can be completed in about fifteen minutes. With regard to results: immediate relief of symptoms has followed operation and lasted for a variable time, but sooner or later symptoms have recurred, though less severe in character. This I believe to be often true after digital stretching. I do not know whether the late results of Walton's cases are as good as they were when he published his paper, but it would be of interest to hear.

In my three cases I can definitely state that at operation (1) there was no cardiospasm, a plain bougie passed quite easily—before anaesthesia only a mercury tube would pass; (2) there was no suggestion of sphincter hypertrophy, in fact no distinctive sphincter could be detected; (3) in all three cases, though varying in degree, there was a well-marked tongue of the Spigelian lobe of the liver lying immediately behind the lower end of the oesophagus.

My object in writing is to record these observed facts in three cases operated on. It would be foolish to attempt to draw conclusions from observations on three cases, but facts rather than theory are necessary to elucidate the problem. In the first case operated on the tongue of liver lying behind the gullet was very noticeable, and my attention was called to it by Mr. Douglas Harmer, who was present at the operation. In both the others there was a definite projection of liver substance, but not so marked as in the first case. That this unusual relationship can have any bearing on the cause of the disorder seems unlikely, but the coincidence is odd. It seems probable that during respiration the oesophagus below the crura becomes wedged to some extent into the V-shaped gap in the liver as the liver is squeezed by the piston-like descent of the diaphragm. It is mere conjecture to suggest that this may have some bearing on the disturbance of the vagi. I record the anatomical facts on the off-chance that it may help in the solution of the problem.

The other two observations seem to support the views held by Hurst. Dr. Hurst has been taken to task for his reference to postural tone, which Sherrington defined as "a reflex contraction excited by stretching." It seems to me that, whatever the cause of the degenerate changes in Auerbach's plexus, the clinical syndrone fits in with a disordered neuro-muscular mechanism and a disturbance of postural tone.

Sherrington called attention to the dual activity of muscle: the one concerned with movement, tonic activity, the other with posture; the one *phasic*, the other *tonic* (plastic tone), distinct physiological functions. This dual function will explain the deformity which results in joint disease, and the marked wasting which follows. Space will not permit a discussion on this theme, though there are some interesting points bearing on the subject under debate. If we accept as a universal factor the findings of Mr. G. W. Rake, we can accept not only the disturbance of the postural tone as described by Hurst, but also inhibition of the phasic tone which should give the stimulus to relax.—I am, etc.,

London, W., Jan. 25th. C. GORDON-WATSON.

SIR,—Mr. Greenwood, in his letter published on January 19th (p. 131), brings forward nothing in support of his contention that achalasia of the cardia is really due to spasm, which did not appear in his original article, to which I have already replied. Moreover, I have published the evidence in favour of the achalasia theory so fully in various places that no further answer is called for.

It is, however, necessary to deal with Mr. Greenwood's personal attacks. He suggests that I came to the conclusion that so-called cardiospasm was due to achalasia of the cardia on the strength of the single case I showed at the Royal Society of Medicine in January, 1915. If, however, he had taken the trouble to read my full paper on the subject published later in the same year, in the *Quarterly Journal of Medicine*, he would have seen that I had at that time investigated seven cases, and that I had waited for five years after the idea of achalasia first occurred to me in order to obtain sufficient evidence in its support before I published my observations.

Mr. Greenwood states that it was Sir Humphry Rolleston's conception of the pathology of so-called cardiospasm that suggested to Sir Cooper Perry the alternative nomenclature, and he accuses me of adopting both the explanation and the terminology without acknowledgement. If Mr. Greenwood has, as he states, consulted the extensive literature, he must know that he is making a false accusation. I have always acknowledged the priority of Sir Humphry Rolleston as the originator of the theory of achalasia, since he called my attention to his 1895 paper when I gave my views on the subject for the first time at the Royal Society of Medicine in December, 1914 (vide *Quart. Journ. Med.*, 1914–15, viii, 300; *Medical Essays and Addresses*, 1924, p. 110; *British Medical Journal*, January 24th, 1925; and *Lancet*, March 19th, 1927).

In my original communication on the subject at the Royal Society of Medicine I described how Sir Cooper Perry had coined the word achalasia in response to a request from me for a single word to express "absence of relaxation." In spite of Mr. Greenwood's suggestion of plagiarism on my part he must be aware of this, because Sir Cooper Perry has never written on the subject himself, the only references to his authorship of the word being in the papers I have myself written.

Dr. Beatty (January 26th, p. 179) still objects to the condition under discussion being regarded as a disease of the cardia. But the hypertrophied and dilated oesophagus is an essential part of the picture, and this occurs in achalasia of the cardia and not in spasm of other parts of the oesophagus. One speaks of carcinoma of the cardia and pylorus, although carcinoma occurs in other parts of the oesophagus and stomach; so why not achalasia of the cardia? Oesophagoscopy shows that most cases of spasm of the oesophagus are secondary to some small local lesions; the case of multiple stricture I referred to is the only one I have seen in which no such lesion was discovered.

I think that some of Dr. Beatty's *x*-ray observations may depend upon a fallacy which I only discovered after much investigation, and which is still ignored by most radiologists. The oesophagus is always full of non-opaque material in achalasia, unless the individual has recently vomited. Hence with an opaque meal, which slowly sinks to the bottom, one does not see the whole eight-inch column. The only satisfactory way to *x*-ray these cases is to empty the oesophagus by a Senoran's evacuator and then give a big enough meal—often a pint or a pint and a half—to fill the distended oesophagus afresh.

In referring to the safety valve of a boiler I meant the simple ball valve such as is used in toy steam engines. This closes by falling back when the pressure ceases to be excessive: cannot one picture a similar return to the normal postural tone of the sphincter when it is no longer forced open by excessive pressure? (I have not replied to Mr. Greenwood's references to postural tone because he is apparently ignorant of Sherrington's work on the subject, and thinks "postural tone" is another wicked invention of mine.)—I am, etc.,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, Jan. 28th.

*** Owing to the heavy claims upon our correspondence columns we are unable to find space for further discussion of this subject.

ENLARGEMENT OF THE PROSTATE.

SIR,—I am interested in the article by Mr. C. A. R. Nitch on "Benign enlargement of the prostate" (January 26th, p. 139) because he apparently recommends the combination of two different operations of prostatectomy—namely, Freyer's operation and the operation that I described and have advocated for a number of years.

The essential points of Freyer's operation are enucleation with the finger through a small suprapubic incision while the abdominal wall is forced downwards with the knuckles to reach the prostate that is forced upwards by a finger in the rectum. The essential features of my operation are a long incision that allows the hand to sink between the recti and the finger to reach the prostate easily, thus obviating the use of the rectal finger and the full display of the bladder base by retractors and the Trendelenburg position in order to remove fragments of prostate, tags of capsule, and flaps of mucous membrane, to ensure a large opening between the bladder and prostatic cavity, and to control bleeding by ligature and suture.

At one part of his article Mr. Nitch recommends the Freyer operation, but qualifies this by saying that "if the walls [of the prostatic cavity] are uneven, and contain irregular masses of small adenomata, an open operation should be performed." Now it must have struck every surgeon who practises the method I described that the finger is not a reliable guide to the presence of semi-detached layers of capsule and flat portions of prostate in the wall of the prostatic cavity, and that inspection reveals quite unexpected irregularities. Moreover, these prostatic relics are only one source of post-operative obstruction and sepsis out of many that can be displayed by inspection and cannot be felt by the finger. The guide on which Mr. Nitch depends in deciding whether to convert a Freyer operation into what he calls an open operation is therefore unreliable.

At another part of the article Mr. Nitch would "emphasize the importance of a long incision in the abdominal wall" to allow free access to the prostate and to "dispense with the necessity for a finger in the rectum." This is no part of Freyer's operation, but it is an essential part of my operation, and one which I have reiterated in the medical press for many years. Mr. Nitch cannot have it both ways. He cannot have a finger in the rectum and avoid putting a finger in the rectum. What, then, does he really recommend? I confess that I am unable to decide.

I am gratified, nevertheless, that Mr. Nitch should have adopted, or at least approved of, even part of the technique that I have recommended so long and so often.—I am, etc.,

London, W.1, Jan. 28th. JOHN THOMSON-WALKER.

TONSIL AND ADENOID OPERATIONS.

SIR,—In the execution of an operation which all surgeons practising in this specialty are often called upon to perform there will naturally be variations of technique, and a wise forbearance should be exercised in the criticism of the methods of others. But are our results all that we could wish?

It would appear that amidst the cloud of controversy certain undeniable principles which we would all admit

are in danger of being lost sight of. They are: (1) An absolutely safe anaesthetic. (2) Removal of the entire tonsil tissue—including the lingual tonsil. (3) Regard to the preservation of the anterior and posterior pillars, and a recognition of the powerful nerve reflex which any roughness to the tonsil would bring into play. (4) A minimum of haemorrhage at the time, and no after-bleeding at all.

In regard to the first point, is it not time that the "myth" of a persistent thymus as a cause of death be decently buried, and every case of death under anaesthetic be frankly investigated with an open mind, and the lesson laid to heart? For the surgeon bears his share of the blame with the anaesthetist.

In regard to the third point, I must join issue with my friend Dr. Horgan, when he says (January 12th, p. 84), "In a surgical operation the safety and efficacy of which is largely dependent upon the celerity with which it can be carried out. . . ." In my judgement neither safety nor efficiency is served by speed, but only convenience.

In regard to the fourth point, surely the danger of haemorrhage is rather under-estimated. Deaths from haemorrhage after this operation are reported in the coroners' courts all too frequently. Each one of these regrettable incidents not only reflects on the surgeon concerned, but affects the attitude of the public towards tonsil operations.

Do children stand loss of blood as well as we suppose? Are we sufficiently critical of the amount of blood our patients lose at the time of operation? If a child has a serious haemorrhage it will take nearly a year to get over its effects.

While we must feel indebted to Dr. Clarke (January 5th, p. 45) for calling attention to the disadvantages of ligaturing large bunches of tissue, I see no reason why the surgery of the tonsil should be denied the advantage of the time-honoured principle of surgical ligature of bleeding vessels. It may be difficult, it may require some skill and practice, but it makes for certainty, safety, and the surgeon's peace of mind. It is clearly the method of choice in the operation for adults.—I am, etc.,

Birmingham, Jan. 21st. MUSGRAVE WOODMAN.

SIR,—I was gratified to read in your issue of January 26th a letter from so able a pen as Dr. Dan McKenzie's expressing views anent the "let it rippers" in tonsil haemorrhage. I am in entire agreement with him, and like him have long since joined the almost maligned army of "haemostats."

In my earlier years I practised the dexterous art of as rapid a tonsillectomy as possible, regardless of coincidental haemorrhage. But a few "humiliating and uncomfortable" experiences, culminating in a chance remark once made by a doctor, woke me up to the realization of the adoption of general surgical principles, *even in tonsil operations*. The doctor whose case I had tonsillectomized, thirty miles away from Manchester, remarked "What shall I do for bleeding?" This set one thinking how uncertain was the technique.

It has always been a mystery to me why there should be this ruthless disregard for haemostasis, for I can recall no other surgical procedure where similar methods are adopted. In the past, the prevalent slogan appeared to be "Quick in, quick out, and quick out of the house," but one is happy in the belief that such is rapidly disappearing. Tonsillectomy after all *is an operation*, though I well remember, after giving a post-graduate lecture on this subject, a member of the audience remarking, "But you are making it a major operation."

Believing as I do that quite 95 per cent. of tonsils in all ages can be completely and expeditiously enucleated with the blunt guillotine, at least let us take time to ensure haemostasis in one tonsil bed before enucleating the second tonsil. This desideratum necessitates a longer anaesthesia than that induced by ethyl chloride or nitrous oxide, though need not, in the majority of cases, take more than five minutes.

Without wishing to reopen the question of anaesthesia in tonsillectomy, I consider that on occasion it may be one of the most difficult duties an anaesthetist undertakes, and calls forth all his skill, co-operation, and experience, which is such a comfort to the surgeon.—I am, etc.,

Manchester, Jan. 28th. F. HOLT DIGGLE.

SIR,—Many readers, especially those who are not laryngologists, must wonder at the conflicting opinions held by your correspondents. Why is it that some laryngologists remove tonsils solely by the dissection method, while others in the great majority of their cases use the guillotine method of enucleation? Why is it that some insist on routine ligaturing of vessels in the tonsil bed, while others say that they never, or shall we say hardly ever, have to tie a vessel? How can we reconcile the results of the ripe experience of Mr. Tilley with the remarkable results of Dr. Horgan?

The modern reverse method of using the guillotine was first advocated in 1910 by Whillis and Pybus of Newcastle. The method was adopted by Sluder in America, and came back to us with enhanced reputation as Sluder's technique. During the war little teaching was done, so it came about that the modern method of removing tonsils is practically a post-war change.

Enucleating tonsils with the guillotine is like hitting a golf ball. It looks quite easy, but is not so easy as it looks. A pedunculated ("tee'd up") tonsil may be quite easy, but to be sure of removing tonsils completely from a "buried lie" requires a great deal of practice—much more practice, in my opinion, than the dissection method. To become really expert one has to remove many hundreds of all types of tonsils, and one has, like golf, to keep in practice or the knack goes. Those whose lot it is to remove fifteen or twenty tonsils a week tend to adopt the guillotine. Those who have one or two tonsil cases sandwiched in their operation list tend to use the dissection method. They have in it a method which has served them well, a method which in good hands will produce the desired result, whereas the guillotine, like the golf club, is fickle, and the more you neglect it the less likely it is to produce a first-class result.

On reading through the letters it is noticeable that the "dissectionists" emphasize the danger of bleeding, and advocate routine tying of vessels. The "guillotinists" state that they rarely get bleeding, and tie vessels only when it is necessary. Does the method explain some of the divergence of opinion?

With the latest tonsil écraseur, described by Mr. T. B. Layton,[1] it is possible to remove tonsils without any bleeding whatever. It requires a more prolonged anaesthesia, of course, than ethyl chloride, as one has to wait the coagulation time of the blood of each tonsil, and its use has not displaced the ordinary guillotine where large numbers have to be dealt with. It occupies no longer time than an ordinary dissection, and it safeguards any damage to the anterior pillars, which is always a possibility with ordinary guillotine operations.—I am, etc.,

Guildford, Jan. 25th. T. B. JOBSON.

SIR,—The source of haemorrhage during and after the operation of enucleation of tonsils appears to be worthy of consideration. It seems to be largely accepted as being arterial in character.

Having performed at least 8,000 complete enucleation cases, under chloroform, I take this opportunity to state that I have rarely seen the smallest spurt from an artery; but, years ago, haemorrhage after operations occasionally caused me considerable anxiety. I found this to be due to the division of a fairly large vein (I have occasionally seen two running parallel). In these cases the vein extends the whole length of the tonsil bed, running vertically from above downwards. Its position is at about the junction of the posterior and middle thirds of the fossa, left after the removal of the tonsil, and is situated in the connective tissue of the capsule. During the operation the greater part of this vein appears to be usually excised, and it may bleed very freely from the extreme upper or lower ends of the wound.

[1] *Lancet*, December 15th, 1928.

I find that Spencer Wells's artery forceps applied to the bleeding point, at the time of operation, and allowed to remain on for five or ten minutes, yield most excellent results.—I am, etc.,

Liverpool, Jan. 28th. E. MALCOLM STOCKDALE.

SIR,—The subject of the paper by Mr. Sandiford and Dr. Clayton (July 28th, 1928, p. 149) was the guillotine operation in children under ethyl chloride anaesthesia, and it was from this standpoint that my letter (December 15th, p. 1113) was written.

An essential factor in the modern guillotine operation is that manipulation with a blunt instrument arrests haemorrhage by tearing and twisting the outer coat of the vessels and causing the inner to contract and retract, thus attaining much the same result as by the use of a ligature. In operation by dissection, especially if scissors are used, ligation, as a rule, is necessary. The gauze pressure, to which I referred, is an extra precaution to control, not arteries, but capillaries which may have escaped the action of the guillotine.

In answer to Mr. Herbert Tilley's questions I would state that in my experience the anaesthetic and analgesic periods produced by ethyl chloride are sufficiently long to admit the application of efficient pressure and to deal with the exceptional vessel by ligature or stitch; indeed, Mr. Tilley answers his own question when he states in a subsequent part of his letter that "the time required for doing so will often be less than eight or ten seconds." Should the period, however, prove too short it is a simple matter to give a little ether, while keeping up pressure on the tonsil bed.

I would be the last to treat the subject of haemorrhage during any operation in a "light-hearted way," but surely Mr. Tilley misunderstands me. I wrote, and mean, "little." A little capillary bleeding, estimated by StClair Thomson to be about one ounce in the guillotine operation in children—in some cases I think it is less—is, I suggest, beneficial in cleansing what is usually a very septic area. If the bleeding is more than a little then the tonsil bed should be carefully examined, and should a definite bleeding artery be found it should, of course, be secured with a ligature, while if multiple bleeding capillaries are seen the pillars should be stitched. Such cases are, however, in my opinion, rare.

With regard to secondary haemorrhage, in a recent series of over three hundred cases, aged 1 to 14, the proportion was under 1 per cent., and in a former series even lower; in these cases the operation described in my former letter was done, and in none of them was it considered necessary to use ligature or stitch. The type of haemorrhage, fortunately rare in children, to cause real anxiety is the flood-like bleeding from a large number of vessels. This is met with in others than recognized haemophilics, though there is little doubt that the cause is a very low coagulation power of the blood. In such cases ligation is impossible and useless, while stitching of the pillars is not trustworthy, and is very difficult to carry out at once. They are, however, in my experience, invariably controlled by packing the tonsil socket with strips of gauze and exerting pressure and counter-pressure from outside for a minute or two, while 10 c.cm. of normal horse serum and 1/12 to 1/6 of a grain of morphine are injected. On careful removal of the packing the bleeding is found to be arrested and the pillars may now be stitched, though usually this is unnecessary. The bleeding, in a much modified degree, may recur in a few cases, when horse serum may be repeated, in two injections, if required, giving in all up to 30 c.cm.—I am, etc.,

Bath, Jan. 18th. H. NORMAN BARNETT.

TREATMENT OF CANCER BY LEAD.

SIR,—In the *British Medical Journal* of January 12th (p. 82) Mr. Hume, referring to my letter published on January 5th (p. 42), says that I made certain statements about the St. Bartholomew's report that are so misleading as to call for correction. Let me then support my statements by facts culled from the original report of the St. Bartholomew's Hospital Cancer Committee on the observations of Mr. Hume and his fellow workers.

Fourteen out of a total number of twenty cases treated received less than 0.25 gram of lead, about half the minimum dosage recommended by us, unless, of course, a satisfactory result is obtained with a smaller dosage. Eight of these fourteen apparently received less than 0.2 gram. Of the six that received more than 0.25 gram, only one seems to have been given as much as 0.4 gram; not a single case was treated to the minimum full extent (see Table II, original report). If, then, my statement that the patients were too ill to receive more than a small quantity of lead was not justified, the only alternative explanation of the unsatisfactory results is that the work was not properly conducted. I shall show, however, that both factors were concerned in producing the bad results.

I complained that a series of only twenty cases was quite inadequate. Mr. Hume asserts that this small number should have been "sufficient to estimate the likelihood of the method being of practical value." Yet in the original report we find the lament that "It is regrettable that so few cases were available for investigation." I would draw attention to the explanation in this report of the paucity of cases treated. "After June" (that is, after only four months' work, a period too short for the satisfactory treatment of any one patient) "there was a very pronounced falling off in the number of cases . . . partly due to a shortage of beds . . . but also to the fact that the staff of the hospital had by that date formed so unfavourable an opinion of the treatment that they were unwilling to submit their patients to it." I cannot believe that any committee of scientific men would regard that period of time and that number of cases as sufficient to enable them to decide a matter so important as that under investigation.

In his conclusions Mr. Hume states that the average duration of life subsequent to treatment was only thirteen weeks, and seeks to throw the blame for this on the treatment. Mr. Hume resists my suggestion that fifteen—it may be that this figure should be eighteen—of his cases were too ill to receive a sufficient quantity of lead; but I reject absolutely, not only on the result of our work, but on that of others, the imputation that lead, properly administered, hastens the final issue. There is, moreover, no evidence in the report that it did so in any of the cases treated at St. Bartholomew's Hospital. In general it may be laid down that only occasionally can patients so near death from cancer as to live only thirteen weeks be treated: we, ourselves, have attempted to treat cases of this kind, and only very occasionally have we been rewarded. To base on a few cases imperfectly treated and observed for such a short time conclusions so sweeping as those expressed by Mr. Hume is to ignore every standard of scientific judgement.

What is the truth about these "physical wrecks" referred to by Mr. Hume? The following are the most relevant statements I can find in the report itself: "The reactions following the injection of lead colloid varied considerably, but they were for the most part transitory, and no fatality occurred which could be attributed directly to lead poisoning. The majority of patients only experienced a little headache and loss of appetite. . . ." The report then goes on to say that the patients who received a preparation *not made by us in Liverpool* "experienced more severe reactions. Severe vomiting occurred in all; two patients had rigors, and one of these became deeply jaundiced for ten days." Yet Mr. Hume hides the fact that the patients treated with our preparation did not suffer unduly, whereas those treated with another preparation did suffer severe reactions, for he says that "Dr. Blair Bell seems to be of the opinion that the treatment was not conducted on proper lines. I would remind him, however, that the preparation used was kindly supplied . . . direct from Liverpool." It seems clear that he has endeavoured to make your readers believe that all the patients became "physical wrecks" following the use of a preparation supplied from Liverpool, and, by inference, has implied that this is the inevitable consequence of the treatment rather than of incompetence.—I am, etc.,

Liverpool. W. BLAIR BELL.

X-RAY DIAGNOSIS.

SIR,—Towards the end of last year there was a discussion in the *British Medical Journal* on the radiologist's activities from the surgeon's point of view and of the surgeon's shortcomings from the radiologist's point of view. Perhaps, in the circumstances, a general practitioner's point of view of one of the contestants—the radiologist—might not be inopportune.

As a general practitioner I owe the radiologist a debt of gratitude for his assistance and guidance in many obscure cases, but there are times when I find him very trying and not a bit helpful, the reason being that there appears to be no hard-and-fast rule followed by the radiologist in his reports on cases submitted to him for expert opinion. For instance, when I send a case, privately, for *x*-ray examination, and want to know if the patient has an arthritis of his spine or a neoplasm, I am rather annoyed when the radiologist volunteers the opinion that the patient is suffering from indigestion. Again, if I ask whether there is a calculus in the kidney it is irritating when he writes back and says it might be appendicitis or merely lumbago! One radiologist refuses to let me see the *x*-ray photograph, while another, although he does send me the photograph and his interpretation thereof, discusses the negative with the patient in his consulting room before ever he writes to me. These are concrete examples.

I submit, Sir, that when one calls in the aid of the *x*-ray expert one wants to know what his *x*-ray investigation shows or does not show; any opinion he may express should, and must, have reference to radiological findings only, and not to conclusions he may have reached merely as a medical man. If I want the opinion of a physician I go to one; on surgical points I appeal to the surgeon; and so, in the case of the radiologist, he satisfies me better so long as he tells me what his *x*-ray examination reveals, and refrains from general deductions.

As to seeing the *x*-ray photograph itself, I contend that, being the doctor in charge of the case (I am referring to cases *x*-rayed privately, and not in hospital), I have every right to see the plate, whether I am considered capable of interpreting it rightly or not. It is for me to judge.—I am, etc.,

VINCENT NORMAN, M.D.,
F.R.C.S.Ed.

Bradford, Jan. 19th.

DENTAL CARIES AND VITAMIN D.

SIR,—I do not think that "the thoughtful family doctor or parent" will be likely to follow what appears to be the advice of Dr. A. E. Barnes and "simply stop oatmeal and give cod-liver oil or some form of irradiated ergosterol and watch results." The thoughtful parent will probably be more inclined to try the simple, rational, and effective method of preventing caries, which, based on reliable data, has been so very successful during the last quarter of a century that it is now not only recognized by the dental profession, but also authorized by the Council of the Society of Medical Officers of Health in its leaflet on the "Prevention of Decay of Teeth." It is not only because this method has been so successful that the thoughtful doctor is likely to choose it in preference to the irradiated ergosterol and no oatmeal regime. He perhaps may know that Australia has been a great wheat-growing country, and oatmeal can hardly be considered as an appreciable part of the dietary of the people. Sunshine is specially abundant, and the irradiation of ergosterol in the skin is amply provided for. Nevertheless, in Adelaide and Sydney the percentage of school children with carious teeth amounts to nearly 95 per cent.—that is to say, a higher percentage than in England.

A similar tale may be told of New Zealand, where, as in Australia, sunshine is abundant and the food good in quality from the point of view of general health and nutrition. Eggs, milk, butter, etc., give ample supplies of vitamin D, but here, too, the incidence of caries in the teeth of children is much the same as in Australia. It has been noted, however, that caries was less prevalent in the schools which were far away from confectioners' or tuck shops.

By way of experimental evidence, "the thoughtful family doctor" may consult the research of May Mellanby, C. Lee Pattison, and J. W. Proud recorded in the *British Medical Journal* for August 30th, 1924 (p. 355). Therein it was shown that one group of children on "ordinary hospital diet" with *two to three drachms of cod-liver oil daily* continued to develop new carious cavities at about the rate of two per annum—that is to say, at much the same rate as they would on any ordinary hospital diet without cod-liver oil. The same research showed also that associated with variations in the amount of sugar and fermentable carbohydrates there went a corresponding variation in the amount of caries. The evidence was so clear on this point that *Science Progress*, commenting thereon, said: "This work verifies with some statistical exactness the well-known hypothesis that caries in teeth is due to carbohydrates."—I am, etc.,

J. SIM WALLACE.

London, W.1, Jan. 19th.

THE "CARDIAC SIGN" IN CARCINOMA.

SIR,—I am afraid I cannot agree with Dr. Stacey Wilson (January 19th, p. 131) in that I have never found the cardiac dullness absent in simple cardiac weakness following influenza.—I am, etc.,

W. GORDON.

Exeter, Jan. 27th.

LIPIODOL.

SIR,—For injection of lipiodol into the bronchial tree, why not use, instead of tracheal puncture, the via naturalis—the glottis, the route that the anaesthetist uses for his ether? I have used no other. The direct laryngoscope, urethral catheter, and 20 c.cm. Record syringe are all the apparatus required; time, one to two minutes. Children supine in a sheet, shoulders held by a nurse, head by an assistant, no anaesthetic; adults, local cocainization, sitting posture. Cases of bronchiectasis should be previously emptied of their sputum by inversion.—I am, etc.,

JAMES ADAM.

Glasgow, Jan. 27th.

HENRY HICKMAN MEMORIAL FUND.

SIR,—The committee has decided not to close this fund at the end of January as provisionally stated. From a contributor in Canada we gather that there may be medical men abroad and in the colonies who wish to send a donation to the fund, and who have not yet had time to reply. The number of contributors has so far been disappointing.

Without anaesthesia, the great achievements of present-day surgery would be impossible. We ask for further support, not only to recognize Hickman officially for the first time, but to claim this pioneer work for an Englishman, and, in so doing, to stimulate original work in anaesthesia. The honorary treasurer is V. Warren Low, F.R.C.S., 76, Harley Street, W.1.—I am, etc.,

CECIL HUGHES, M.B.,
Honorary Secretary, Hickman Memorial Fund.

London, W.1, Jan. 28th.

Medico-Legal.

A CHRISTIAN SCIENTIST'S DEATH.

IN issuing a death certificate Dr. John Frankland West of Oxford took the unusual course of adding "Christian Science" to the causes—that is, dysentery and extreme wasting—which, in his view, had led to the death of Mrs. Hilda Gwendoline Davis, a Christian Scientist for twenty years.

The evidence at the inquest showed that Mrs. Davis entered Coston House, a Christian Science nursing home, and that Mrs. Robinson, the superintendent, had informed the relatives that while Mrs. Davis was at a Christian Science home there could not be a medical examination or report. Mrs. Davis was removed to the home of her daughter, but such was her outlook that she refused medical attention and would not admit that anything was wrong with her, although she was in a condition of extreme emaciation. Her son-in-law, Mr. J. R. Baker, a university demonstrator in zoology, was asked by the coroner if he had any complaint against the superintendent of Coston House, and he replied that he thought that anybody seeing a person in so emaciated a state should have taken steps immediately to secure medical attention. Dr. West said that when he first saw Mrs. Davis, upon her leaving the home, she was very ill and wasting, and he considered her condition had been definitely aggravated by the lack of medical treatment. If he had not inserted in the death certificate the words "Christian Science," but merely adhered to the textbooks, no inquest would have been held.

The jury returned a verdict of death from natural causes.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

THE House of Commons spent this week in committee on the later clauses of the Local Government Bill, together with its schedules, and proposed new clauses. Several aspects of public health administration were debated. Next week the House will be in committee on the Scottish Local Government Bill, to which the Government hopes to move amendments for co-ordinating hospital services, provided that agreement is secured in preliminary negotiations with the voluntary hospitals and the local authorities.

On January 29th the Parliamentary Medical Committee received a deputation from the Poor Law Medical Officers' Association, headed by Dr. Bruce. The subject discussed was the pension rights of Poor Law officers as affected by the Local Government Bill. Assurances which had previously been received from Mr. Chamberlain by members of the Medical Committee were related, and in part reassured the deputation. On the previous day Mr. Neville Chamberlain, receiving a deputation arranged by the Health and Housing Committee of Conservative Members, said he hoped before long to make the Act of 1922, which provides for contributory pensions schemes, a compulsory one for all local authorities, so that all service under local authorities would count equally for pension. Where local authorities had adopted the Act of 1922 no difficulty would arise under the new bill, and he would endeavour to safeguard the rights of those Poor Law officers who wished to remain under the Act of 1896.

The Parliamentary Medical Committee has arranged to receive at its meeting next week a deputation from the Medical Practitioners' Union, which will discuss dispensing under the National Health Insurance Act.

Local Government Bill.

The House of Commons went into committee on January 23rd and resumed the consideration of the Local Government Bill at Clause 68, which provides for the discontinuance of grants. Mr. GATES proposed to qualify this provision by adding the words "other than grants for maternity and child welfare services." He explained that his amendment would keep the grants for these services, as at present, on the percentage system, instead of bringing them under the block system. Last year the maternity and child welfare grant cost £1,052,000. The service was young, growing, and very important. Ante-natal work was only beginning to be considered, and maternal mortality had hardly been considered at all under the schemes. In the last five years the cost of the service had increased by 36 per cent. Sir George Newman had pointed out in his latest report that 25 per cent. of children entering elementary schools suffered from physical defects which could have been prevented by better treatment before entering school. Hitherto half the expenditure under the Maternity and Child Welfare Act had been borne by the Ministry, but under the bill the local authority would decide how much of a block grant should be spent in maternity and child welfare work. Mr. Gates did not think that Clause 86 of the bill provided the Minister with a reasonable safeguard to induce a laggard authority to expedite the work of maternity and child welfare or to increase its amount in view of growth of population. The block grant had originally been fixed for a term of five years. The Minister now proposed that the first period should be three years, the second four, and the subsequent period five years. Mr. Gates considered this to be a great improvement, but said that within three years there might be an increase in the necessities of the neighbourhood which would have to come out of the rates, to the disadvantage of the maternity and child welfare services. An objection had been raised that the percentage grant system implied considerable official interference with local authorities. Mr. Gates said that during many years in local government work he had never heard anything but praise of the official interference by the officers of the Ministry of Health in such work as maternity and child welfare. The advice of these officials had been a great help to local administrators, and had stimulated many lagging authorities. Much of the work connected with maternity and child welfare was, and would be, done by voluntary associations. These were much discouraged by the provisions of the bill. He hoped the Minister would make the voluntary associations feel that they would have full opportunities for work in the future. Some, but not all, had received grants from their county councils. In every case they had received from the Ministry 50 per cent. of their approved expenditure. Under the bill that passed. Whatever the voluntary associations received they would now have to get through the local authorities, and Mr. Gates presumed the figure would be calculated on 1928–29. The Minister had not enough power to see that these associations were recognized by the local authorities. In Mr. Gates's borough of Kensington maternity and child welfare work was started over twenty-three years ago under a medical officer, who got together enthusiastic voluntary workers, and good work was done. Infant mortality in the borough had fallen from 140 deaths per 1,000 to 70. Mr. Gates added that the National Council of Women and other societies supported his amendment.

Mr. GREENWOOD said that the Labour party supported the amendment. Every social service to-day was developing, that being particularly true of maternity and child welfare, the treatment of tuberculosis, and of mental deficiency and venereal diseases. Not a single health service had been utilized to the extent Parliament permitted. In England and Wales last April 847 ante-natal clinics were struggling to cope with the work. Nobody could say they were sufficient. The real opposition to the development of these health services came from the Treasury, which argued that the percentage grant system involved increasing expenditure, which was uncontrollable, and could not be forecast. He contended that the expenditure could be forecast within narrow limits. The State could rule out expenditure which it did not think should receive assistance from the Exchequer. He did not pretend that the percentage grant was in itself an ideal system, but it would get as near the ideal as possible if modified by density of population, poverty, or other necessary factors. Under the Government's scheme every new development of maternity and child welfare work after the grant had been fixed would be a new burden, without a penny from the Ministry of Health. Sir George Newman, in his last report, had said that adequate ante-natal provision, whether provided by doctors or midwives, with the assistance of the municipal clinic or the maternity hospital, was the only sound foundation upon which an effective scheme for a maternity service could be built. Yet Mr. Chamberlain was making that foundation unsound.

Mr. PERCY HARRIS said that in 1916 there were 650 maternity and child welfare centres; in 1928 there were 2,684. He denied they were chiefly found in the richer areas. In London there was more activity in the poorer areas, and in Bethnal Green, the poorest borough in London, there was probably more activity than in any other part of the country.

Dr. VERNON DAVIES said both sides were anxious that nothing should be done to interfere with the development of this service. They simply differed on the best means of dealing with it. He did not agree with Mr. Gates's amendment, being definitely opposed to the percentage grant and in favour of the block grant. Under the percentage grant money was given simply according to ability to pay. The percentage grant encouraged extravagance, and necessitated very careful Government control. These grants were given in the first place as a stimulus. The essential nature of a stimulant was that it was temporary; if made permanent it tended to become a narcotic. All local authorities had the opportunity for some time of taking advantage of the percentage system for maternity and child welfare, but a large number had not done so, from lack of interest, from fear of increase in the rates, or from poverty. The last was the main cause, and on behalf of the poorer authorities the House should welcome the action of the Minister in bringing in the block grant. The Minister had told them that the average grant per head for maternity and child welfare was in the region of 5d., but that in certain towns the block grant would bring the money up to 200d., and even more. No one could say the services would be starved. The money would be there if the public cared to have it. By Clause 86 the Minister could either initiate these services or see they were carried on efficiently. Public opinion, knowing of the new money which would come into the district by means of the block grant, would begin to insist on local authorities using it for this specific purpose. As a keen supporter of maternity and child welfare work, who had initiated and carried on such a service, he was convinced that the day of the percentage grant for maternity and child welfare services was over. Money was essential for the success of a child welfare centre, but what was needed was an enlightened public authority, and above all a conscientious, well-trained, tactful woman as nurse. If they had a thoroughly trained nurse with an instinctive love for mothers and children, and a medical officer with the same characteristics, they would have a successful maternity and child welfare service. People would only attend if they had the fullest confidence in the nurse and doctor, and were received with tact, good will, and sympathy. Personnel was much more important than money. The results of the block grant would be an increased number of centres, particularly in necessitous areas, and an efficient standard in all centres. There would be no Government control of expenditure, and that would stimulate initiative and efficiency. The services would benefit by deliverance from the insidious charm of the stimulating cocktail of percentage grants.

Miss LAWRENCE remarked that Dr. Vernon Davies had argued that tact and sympathy were a good substitute for money. She denied that Clause 86 gave the Minister power to insist on maternity work being undertaken. No clause asking for a reasonable standard could turn optional services into compulsory services. These services, with tuberculosis, venereal disease, and other services, were optional. She quoted evidence given on behalf of the Ministry of Health to the Royal Commission on Local Government to the effect that the Minister had no power to compel local authorities to institute maternity and child welfare schemes,

but that the lever of a substantial grant had in practice achieved a fair efficiency. At present the Minister could make proportional grants direct to voluntary societies. Under the bill all they would get was whatever the local authorities gave them by way of a scheme approved by the Ministry. The Labour party stood for a logical extension to mental deficiency, tuberculosis, venereal disease, and care of the blind of the principles which it had advocated on this amendment. Local authorities had to be bribed by a 75 per cent. grant to take up venereal disease work. Would they carry it on when every penny they spent had to be taken out of block grants handed over for other purposes?

Sir DOUGLAS NEWTON said the new system would be better for voluntary organizations interested in maternity homes, which at present had to apply to many boards of guardians for contributions. In future they would apply to major authorities, which were more likely to be sympathetic.

Lady ASTOR said that under Clause 83 the voluntary associations were in a stronger position than ever before. Health services had not grown because of popular demand but in spite of general apathy, because they were inspired by the central authority, working mainly through voluntary associations. Local authorities seldom moved unless they were prodded by the Minister of Health. The problem of the children between 1 and 4 years of age had to be faced. Of 82,000 children under 14 who died during 1928, 23,000 were between 1 and 4 years of age.

Mr. CHAMBERLAIN said the Registrar-General's figures for 1928 showed that the infant mortality rate came down last year to 65 per 1,000, being 4 per 1,000 lower than the previous best record in this country. The maternity and child welfare service had materially contributed to that tremendous improvement. The Treasury was unlikely to impose a change of policy regarding a service in which the Minister of Health took the keenest interest and where it could only gain a few hundred thousand pounds. It had been said that the maternity and child welfare service was not popular. The mental deficiency service was far more unpopular, and therefore if they exempted the former service from the block grant on that score it was difficult to see where they could draw the line. At the Ministry of Health he considered the reports which came in from all localities, and he did not find the present maternity and child welfare system satisfactory. He agreed with Mr. Greenwood that there should be many more ante-natal clinics. To show how the present system worked he cited the grants per child under 5 years which were paid to four poor towns—Gateshead 27d., Dudley 21d., Tynemouth 36d., and Merthyr Tydfil 43d. Manchester received per child 128d., Liverpool 107d., Leeds 140d., and Eastbourne 200d. How could they say that kind of distribution was likely to encourage adequate maternity and child welfare services in poorer districts? As the service was to-day the average cost over the country was 5d. a head. Under the Government scheme many towns and counties were going to gain many times that amount. He had offered a guarantee of a shilling a head, but that was only to the few places which would not gain more under the scheme. It was true that under Clause 86 he could not force local authorities to give adequate maternity and child welfare services, but he would have a powerful lever in being able to take away from the grant which they had already got. Instead of actually using that lever he would only have to whisper into the ear of the local authority "Clause 26." No local authority would resist a reasonable demand for adequate services of this character or risk the loss of the grant. He attached importance to the work done by voluntary associations, and under Clause 83 the Minister himself would see that their interests were looked after. In the case of London the bill provided that the Minister should make a scheme providing how much the London County Council and how much the borough councils were to contribute to any particular voluntary association. In the country the inspections of voluntary work by the officers of the Ministry would go on in a different form, and the Minister's approval had to be obtained to the scheme under which the contributions of the local authorities to the associations were fixed. He was putting a clause down on the paper to give him power, after consultation with the local authority, to revise a scheme during a quinquennium when an association desired to extend its services, or when some body of people desired to form a new association. Again, if Parliament should impose on local authorities a new service which would mean new expenditure by them, then it would be just that Parliament should make an additional contribution towards the cost, and he had put down a new clause declaring this to be the intention of Parliament. Finally, he remarked that the whole system introduced by the bill would have to be reviewed before many years.

Mr. PALIN said that as an economy the money spent on infant and maternity welfare centres was the wisest expenditure a municipality could make.

Mr. JAMES HUDSON represented that Dr. Vernon Davies had said that sympathetic and tactful nurses and voluntary workers could do all that was required. He contended that skilled medical attention was required. Huddersfield had recently been divided into three parts, and in one area, instead of leaving the care of mothers and children to sympathetic persons and nurses, an arrangement was made for a monthly visit before and after birth by a skilled medical man. Medical assistants were specially appointed for the job. In the third of the town where this experiment was tried the death rate was reduced by 10 or 11 per 1,000 during the brief period of the experiment. He regretted that Huddersfield Town Council had not applied the system in the other areas of the town.

Mr. CECIL WILSON said that in Sheffield infant mortality had dropped about 15 per cent. since 1923, but mortality from puerperal fever and other accidents of childbirth had gone up 88 per cent. The number of cases going to the maternity centre had increased by 238 per cent. since 1921.

Dr. FREMANTLE said that, as an old medical officer of health, he had been in close touch with the voluntary associations and in co-operation with them for thirty years. When the bill was first announced he had shared the anxiety at the abolition of the percentage grant, but now he was convinced that the bill, under certain conditions, was a great advance, and they had to make the best of it. Medical officers of health must recognize that the new principle of weighted population which had been introduced for calculating the block grant was an interesting new factor in public health administration. The weighting of the population according to the number of children under 5 years old and the number of the unemployed had got possibilities. A great deal depended on how the local authorities were going to use the powers given them under this bill. Those who had the administration of these services felt again and again that it was impossible to move because of the lethargy of many local authorities. Some, especially in industrial centres, were keen, some indifferent, and some actually hostile. Under the bill there would be opportunity for getting greater interest and for focusing attention upon local government. If they could get a largely increased interest in local government they could trust the local authorities to carry out the block grant system properly, with great advantage compared with the present system.

Mr. LANSBURY said that under the percentage grant system the death rate among children in the poorer districts of London, Leeds, Bradford, and Bristol had been more than halved. The least falling off of money would mean an increase in the death rate among children.

Mr. GATES, in view of the sympathetic speech by Mr. Chamberlain, asked leave to withdraw his amendment. Leave to withdraw was refused, and on a division the amendment was defeated by 130 to 206, a few Conservatives voting for it. Clause 68 and subsequent clauses were then added to the bill, and further progress was made with the bill on the following day, January 24th.

On January 25th the House again went into committee on the bill and discussed Clause 75, authorizing the Minister to prepare with county and district councils schemes as to maternity and child welfare.

Miss SUSAN LAWRENCE asked where the money would come from. The clause, she said, proposed to give the Minister power, wherever in a county any authority had shown willingness in the matter, to force the county to spend as much as might be necessary out of the county apportionment on this service. The organization of this service, if properly carried out, would cost a great deal. Institutional treatment for this class of service was backward. They had only 2,460 local authority beds at maternity hospitals. Only 122 local authorities had institutional treatment for puerperal fever, and only 252 had arranged for special nursing. There were only 98 day nurseries in England and Wales. They ought to spend £4,000,000 extra to deal with this question, and there should be more severe compulsion than was proposed in the bill. The reform proposed in the clause was good in itself, but would in the long run be carried out at the expense of the ratepayers.

Dr. FREMANTLE said he would consider the proposal made by the clause in the light of the practical experience he had as a county medical officer of health. In gingering up local authorities in his area to undertake increased expenditure he had been no exception among medical officers of health. The difficulty hitherto had been that under the Local Government Act, 1888, the power of county councils over district councils had been shadowy. All that could be done was to try to persuade them. As a rule insufficient money was available, and that was why these services had not been developed in the past. In the future more money would be available for every county and county borough, and there was a great possibility of its being expended. The county medical officer of health would be able to go round to the district medical officers of health, and if told that an authority had decided not to introduce these services, he could urge that the question be raised again. Altogether there would be a good case for starting new centres and developing the work. Mr. Palin had assumed that local authorities had not been stirred up in Yorkshire, but Dr. Fremantle said he knew a medical officer in the West Riding who was very active in that way. Dr. Fremantle thought the clause would be a great help to maternity and child welfare.

Dr. VERNON DAVIES said that as he understood the clause the centres established by district councils would be worked independently of the county council, which would have no direct control

over their administration or medical service. Such centres were intended to work in a consultative capacity and only to a small extent as treatment centres. The maternity and child welfare centres could not undertake the treatment of cases of tuberculosis, venereal disease, or early mental trouble, neither could they treat the serious diseases of women. They would have to distribute the serious cases to the hospitals, and the expense would not amount to very much. The fear that this service would be hampered by the bill was groundless.

Miss WILKINSON said all the House recognized the amount of good work done by Dr. Fremantle on such questions, but she suggested that he was wrong in his interpretation of Clause 75. It did not say what would happen to the districts which had not a maternity and child welfare committee. Maternity homes in crowded areas, toward the provision of which the Ministry had promised 50 per cent. of the maintenance charges, were being held up pending the passage of this bill.

Mr. RENNIE SMITH said that the nation as a whole lagged behind in pre-natal effort and in the co-ordination of the best scientific treatment round about the actual birth. A considerable allocation of money was needed to get trained medical officers and nurses in the areas where they had not enough, and in many other areas where these services did not exist.

Mr. ARTHUR GREENWOOD said that in many county areas where there were only a few maternity and child welfare schemes in operation the general sense of other local authorities in the counties would be against the expenditure of additional money, and the Minister would be unwilling to apply much pressure.

Mr. CHAMBERLAIN said he had listened in weariness of spirit to fallacies and misstatements. If these health services were made compulsory the Government must lay down precisely what each local authority had to do. Maternity and child welfare services in a county were normally the work of the county council, but certain county districts had been given powers under Acts of Parliament to carry on these services in their own areas. They were islands in the county. In the new county apportionment the Government included the grants which had hitherto been given to these separate areas, and the purpose of the clause was to determine the amount of money which was to be taken out of the county apportionment and to be handed to the authority which had to carry on this service in its own area. There were only about 250 of these authorities, and there was no case where one of them was doing nothing. He begged the House not to take too gloomy a view of the progress of the maternity and child welfare service. He was doing all he could to improve it, and hoped to have an opportunity of doing more soon. The amount in the Labour party's estimates for maternity and child welfare service was £814,000. This year it was £1,052,000. In 1924–25 there were 639 ante-natal clinics in the country. Now there were 847. The number of beds in maternity homes and hospitals recognized by the department had risen from 2,001 in 1924 to 2,478. They were making substantial progress, and under the Government scheme there would be ample funds for all local authorities which had the power to provide maternity and child welfare services as fast as they would find possible.

Clause 75 was added to the bill by 158 to 78. Discussion followed on clauses dealing with Exchequer grants.

The House on January 28th again considered the bill in committee. On Clause 83, which deals with contributions by councils to voluntary associations in respect of maternity and child welfare, Sir LESLIE SCOTT moved an amendment to impose a statutory obligation on county and county borough councils to consult voluntary associations doing maternity and child welfare work before framing their schemes.

Mr. NEVILLE CHAMBERLAIN said that the amendment was unnecessary, because it was impossible for any council to frame a scheme of that kind without consulting the voluntary association. The clause provided that the county councils or county borough councils were to prepare schemes for securing payments by them of annual contributions towards the expenses of voluntary associations. To know what these expenses were the councils must know what the associations were doing, were able to do, and proposed to do in future. The Minister of Health also had to approve of the schemes, and if the schemes were submitted without consultation with the voluntary associations it would be open to the associations to represent to the Minister that they had not been consulted. The amendment was withdrawn.

Mr. HURST moved an amendment giving power to the Minister of Health to include in the schemes prepared by county councils provisions whereby contributions towards the costs of inmates in a maternity home within its area might be enforced against the council of any other county or borough where an inmate normally resided before entering the home. He said that the amendment would enable the unmarried mother to avoid local scandal by going into a home at a distance.

Mr. CHAMBERLAIN said it would be a mistake to make it more difficult for maternity homes to take in unmarried mothers from other localities. In the past direct grants had been given from the Exchequer to the homes, but in future the grant would be given to the local authority in whose district the home was situated. The local authority would not have discretion to spend the money on anything else. For seven years it would receive 75 per cent. of the grant previously given, for the next five years the grant would be 50 per cent., and for another five years 25 per cent. The amendment was rejected.

Sir KINGSLEY WOOD moved an amendment giving power to the Minister of Health, after consultation with the local authority concerned, where it was desired to start or further a maternity or child welfare scheme, to alter the scheme so as to provide for such contributions, or increased contributions, as he considered just. He said that with this amendment and the original clause in the bill the Government was giving a very strong position to the voluntary associations carrying out this work.

Dr. FREMANTLE said that his name and that of Major Hills were down to an amendment earlier on this clause, but he purposely did not move it because this amendment covered the same ground. He had tabled his amendment because the clause did not provide for the future expansion of this service. It was put down on behalf of the Midwives' Institute and the Queen Victoria Jubilee Institute for Nurses. Those professional bodies, which were largely neglected by public opinion, were at the bottom of the working of these maternity associations, and they would, he believed, be abundantly satisfied by this amendment, which seemed to him to cover the substance of the amendment which he had put down and also other points which he had in mind. He hoped that there would be a possibility of covering now, for the first time, the whole of the counties with the work of the county nursing associations in nursing and midwifery work, which had been extending, but extending slowly. He hoped, speaking on behalf of the midwives, that the clause as amended would be successful.

The amendment was agreed to, and Clause 83 was added to the bill.

On Clause 84, which provides for contributions by councils to voluntary associations in respect of other health services, Sir LESLIE SCOTT moved an amendment providing that the Minister should, before the beginning of each fixed grant period, make a scheme providing for the payment of contributions by councils of counties and county boroughs of such amounts as might be specified in the scheme, to voluntary associations which undertook to provide, centrally or locally, services for the welfare of defectives, including the ascertainment, assistance, or supervision of defectives whilst not in institutions. As the clause now stood some of them feared it might limit the services for which the grants under the clause might be given. A great deal of the best work for mental defectives was not done by the local authorities, and he wished to make sure that there would be no limitation in future in grants for work done as assistance to the local authorities.

Sir T. INSKIP (Attorney-General) said he could give Sir Leslie Scott the assurance he desired, and the amendment was accordingly withdrawn.

Sir WALTER GREAVES-LORD moved an amendment providing that the Minister of Health should, before the beginning of each fixed grant period, make a scheme providing for the payment by county and county borough councils of such amount as might be specified in the scheme to the central council of an approved organization which provided services, in the nature of general publicity and educational propaganda, in furtherance of the prevention and treatment of venereal disease. He could not understand why the Government had thought it necessary in the bill to take a course which would destroy to a large extent the activity of one voluntary association—the British Social Hygiene Council—whose work had been recognized not only by the Government, but by the Royal Commission on Venereal Disease, and had been done to the expressed satisfaction of the Ministry of Health. Other health services, such as maternity and child welfare, and the care of mental defectives and of the blind, would be affected if anything was done to diminish the efficiency of the measures taken for the prevention and curative treatment of venereal disease. The amendment would enable the Minister to make an equitable scheme, which would provide for a contribution based upon 5s. per 1,000 of the population. If, however, the Minister could deal with the matter as he desired in Clause 86 of the bill he would be content.

Sir KINGSLEY WOOD resisted the amendment. He said that Sir Walter Greaves-Lord, following, he supposed, the precedent already established in relation to the maternity and child welfare services, sought to secure that local authorities should be obliged to pay an annual contribution to the British Social Hygiene Council, or some corresponding body. The Minister of Health shared with the mover of the amendment his appreciation of the work which that council had achieved, especially in the earlier days, when that kind of work was much more unpopular than at present. But local authorities were actively engaged in the work of stamping out the disease. During the present year some £7,500 had been spent by them. Many local authorities desired to include venereal disease as one of the subjects in their general scheme of health propaganda. There was a distinction between the position of voluntary agencies which were carrying out maternity and child welfare work and those undertaking purely propaganda work. The responsibility for the health services rested with the local

authorities, who would strongly resent being obliged to contribute towards the expenses of a service which they might not care to apply. He saw no reason why the work of the British Social Hygiene Council should not continue in conjunction with the work of local authorities, but there was considerable objection to giving this compulsory power to the Minister of Health and compelling them to contribute. That was going to an extreme length. The Government was proposing, in a new clause standing in the name of Mr. Chamberlain, to give power to the Minister to pay a contribution to voluntary associations out of the sums payable out of the general Exchequer grant.

Dr. FREMANTLE supported the amendment. He said that he took up this attitude with the greatest reluctance and after the most sincere and continuous study of the bill. As a matter of conscience, he felt that he was bound to do so. The situation had not been met by the Parliamentary Secretary, nor by anything which he had heard from those connected with the Ministry of Health. There was a strong feeling on this subject.

Mr. CHAMBERLAIN said he admitted at once that the amendment had received very weighty support, and he opposed it with very considerable reluctance, partly because he valued very much the work done by the British Social Hygiene Council, work in which in the past he had taken considerable interest himself, and partly because he admired the devotion with which Sir W. Greaves-Lord had thrown himself into a business which certainly was not of a particularly popular character. The Minister of Health was in quite a new position in regard to all these services. It was only right that the local authorities should perform their duties in an adequate manner, and if they were not doing so because they would not use the services of this particular body, then it was quite clear that he would have a very strong case for asking that they should make their contribution. He asked members to think well before they compelled these responsible bodies to contribute to something of which they might not approve. He, as the responsible Minister, did not desire to see this body disappear, and he should take all the steps he could within the limits of the bill to assist it.

Dr. DRUMMOND SHIELS said that the distinction which the Minister had drawn between making a claim on the local authorities to support the central body and his refusal to compel them did not seem to go very well together. The right hon. gentleman admitted that the national propaganda was essential for the prevention of these diseases, and at the same time he refused to give support to the body which dealt with them.

[At this point the guillotine fell on the debate, and the amendment was defeated by 204 votes to 95. The clause was then agreed to and the debate adjourned.]

*** The conclusion of the debate on the Local Government Bill is unavoidably held over till our next issue.

Radium Requirements and Supplies.—Mr. CHAMBERLAIN stated, on January 24th, that the subject of radium requirements and supplies was still under consideration by a subcommittee of the Committee of Civil Research. On January 28th Sir KINGSLEY WOOD told Mr. R. Morrison that the subcommittee of the Committee of Civil Research would not report to the Ministry of Health on the supply of radium. The Minister of Health had arranged for the inquiries made on the subject in the House of Commons to be brought to the notice of the subcommittee, and he trusted that their report would be available at an early date.

Post-vaccinal Encephalitis.—In the House of Commons, on January 25th, Mr. GROVES called attention to the fact that an inquest into the death of a boy at Castleford in November, 1928, from post-vaccinal encephalitis had returned a verdict of death from natural causes, whereas the verdict on a boy who died in Poplar Hospital from the same cause on January 14th had been death from misadventure. Mr. CHAMBERLAIN said that both deaths had been classified under the heading "vaccinia" for the Registrar-General's mortality statistics.

Special Institutions for Ex-Service Medical Cases.—On January 23rd Colonel STANLEY, answering Mr. Smedley Crooke, said that the two special institutions which the Ministry of Pensions set up in 1923 with the assistance of the Board of Control, and in conjunction with the general medical hospitals, were specifically designed for ex-service medical cases in which the Ministry is advised that a chance of recovery or improvement is offered by occupational training and instruction. Incidentally Colonel Stanley deprecated as inaccurate and needlessly offensive the description of mental hospitals provided under the Lunacy Acts as "pauper lunatic asylums."

Treatment of Enlarged Tonsils.—Mr. ROBERT RICHARDSON asked Lord Eustace Percy, on January 24th, whether, in view of conflicting medical testimony on the advantage of, or necessity for, the extraction of enlarged tonsils, he would recommend local educational authorities to bring to the notice of their medical officers the fact that there was an alternative treatment, and advise them not to prosecute parents who desired to follow such treatment rather than to have recourse to the operation. Lord EUSTACE PERCY did not think the course suggested was necessary. Medical officers of education authorities knew there were alternative methods of treatment for enlarged tonsils. Operative treatment would only be recommended by them when other methods had been tried and failed. In the reports of the Board of Education for 1921 and 1923 the position of the Board was indicated, and it was clearly stated that the Board of Education had consistently advised that operation should not be undertaken except with the full consent of the parents or guardians of the child. In reply to a similar question regarding infant welfare centres, it was stated that it was not the practice at these centres to advise the removal of tonsils, but to refer children needing treatment to a hospital or private doctor for advice on the appropriate form of treatment.

Idiosyncrasy to Chemical Poisons.—Mr. DUFF COOPER (Financial Secretary to the War Office) told Mr. Will Thorne, on January 24th, that his attention had been drawn to a report of the inquest on a research worker at Woolwich Arsenal, where the coroner recorded a verdict that death was accelerated by the deceased having come in contact with some chemical poison allied to nitroglycerin. Mr. Cooper said he was advised that nitroglycerin poisoning was extremely rare, and might imply a predisposition in the individual which could not be ascertained beforehand. Instructions were being issued that if any worker felt indisposed as a possible result of contact with the material he was using he must at once report the fact to his superior.

Notes in Brief.

A bill to regulate the sale of reconstituted cream, presented in the House of Commons on January 24th, is backed by Dr. Vernon Davies.

Mr. Chamberlain states that available statistics do not allow properly comparable figures to be given for the death rates in the United States, Germany, and France from small-pox and from pulmonary tuberculosis.

Universities and Colleges.

UNIVERSITY OF OXFORD.

AT a congregation held on January 24th the following medical degrees were conferred:

D.M.—C. J. Fuller.
B.M.—S. B. Davis.

UNIVERSITY OF CAMBRIDGE.

AT a congregation held on January 26th the following medical degrees were conferred:

M.D.—A. D. Porter.
M.B., B.CHIR.—W. J. Lloyd.
B.CHIR.—S. D. Isaacs, W. E. Underwood.

UNIVERSITY OF LONDON.

THE Senate has accepted with thanks an offer of the committee of the Bayliss-Starling Memorial Fund of the sum of £2,500 for the establishment at University College of a scholarship for training in physiology and biochemistry to commemorate the connexion with physiology of Professors Sir William Maddock Bayliss and E. H. Starling.

It has been resolved to institute an academic diploma in clinical pathology.

The degree of D.Sc. in Anatomy has been conferred upon Mr. H. A. Harris, an internal student of University College, for a thesis in the form of a series of memoirs dealing with the problems of bone growth, radiology, and teratology, published in various medical and scientific journals.

The degree of D.Sc. in Psychology has been conferred upon Mr. J. C. Flugel, an internal student of University College, for a thesis entitled "Studies in mental oscillation and related functions."

Mr. H. L. Eason, C.B., C.M.G., has been reappointed a member of the General Medical Council.

Professor W. W. Jameson has been appointed to represent the University at the fortieth congress and exhibition of the Royal Sanitary Institute, to be held at Sheffield in July.

The William Julius Mickle Fellowship for 1929, of the value of about £250, has been awarded to Dr. A. Sterling Parkes, in respect of the work he has carried out during the past five years on the physiology and biochemistry of the organs of reproduction.

UNIVERSITY OF MANCHESTER.

DR. J. F. WILKINSON has been appointed director of the laboratory of clinical investigations, in succession to Dr. W. Morrell Roberts. Dr. Jethro Gough has been appointed demonstrator in pathology.

LONDON INTERCOLLEGIATE SCHOLARSHIPS BOARD.

Medical Scholarships.

THE London Intercollegiate Scholarships Board announces that an examination for nine medical scholarships and exhibitions, of an aggregate total value of £1,170, will commence on April 16th. They are tenable at University College and University College Hospital Medical School, King's College and King's College Hospital Medical School, and the London (Royal Free Hospital) School of Medicine for Women. Full particulars and entry form may be obtained from the Secretary of the Board, Mr. S. C. Ranner, M.A., the Medical School, King's College Hospital, Denmark Hill, S.E.5.

Obituary.

ANDREW LITTLE, M.B., C.M.,

Consulting Surgeon, Royal Eye and Ear Hospital, Bradford.

THE medical profession in the Bradford district learned with deep regret of the death, on January 9th, of Dr. Andrew Little, in his sixty-fifth year; he had been an outstanding figure in their midst for more than thirty years.

Andrew Little received his medical education at Aberdeen and the London Hospital, graduating M.B., C.M.Aberd. in 1889. After holding appointments in London and Liverpool, he settled first in the Burnley district, and later removed to Bradford. Early in his medical career he devoted himself to eye, ear, throat, and nose work, a combination of specialties which was common in the North of England at the time. He became associated with the Royal Eye and Ear Hospital in Bradford as far back as 1892, and was one of the full surgeons there from 1901 to 1918; from 1911 to 1922 he was honorary laryngologist to the Bradford Royal Infirmary. At the end of the war he gave up his active hospital duties, continuing at the Royal Eye and Ear Hospital as honorary consulting surgeon.

Dr. Little was widely recognized as a leading authority in throat, nose, and ear work in the West Riding; he had built up a large consulting practice, from which he retired in 1922 to live in Westmorland. His activities and interests were many and varied, and he was at one time co-editor of the *Caledonian Medical Journal*, but perhaps he was most of all attached to the preventive side of his own particular work. He was invited by the Bradford City Council in 1913 to act as their consulting ophthalmic and aural surgeon, a position which he held for six years; during this time he greatly developed the municipal work along lines satisfactory alike to the council, the public, and the medical profession. His appointment was one of the first of its kind in the country, and by his keenness, shrewdness, and ability to inspire others he laid the foundation of that happier state of co-operation which exists in all branches of the medical profession—hospital, private, and municipal—in Bradford to-day. He threw himself whole-heartedly into the aspects of his work which affected child life, and he recast the principles of the treatment and education of the child with defective vision, the outcome of which was the new Bradford Myope School.

To all who knew him, Andrew Little was a valued friend and a helpful colleague; his passing leaves a sense of deep personal loss. His illness was borne with fortitude and resignation, and his end came as the completion of a life's duty faithfully and fully done. His wife predeceased him by one year. He leaves behind him an adult son and daughter, at whose house he died. J. B.

His many friends in Scotland and England will share our regret in recording the death from pneumonia following influenza of Dr. GEORGE SMITH SOWDEN, which took place at Elgin on January 19th. Dr. Sowden was born of Scottish parentage in Madras forty-six years ago, where he spent his early boyhood, and then came to this country to be educated at Elgin Academy and Edinburgh University, graduating in arts and medicine in 1909. After graduation he spent some years at Newcastle-upon-Tyne and Kirkby Stephen. On the outbreak of war he volunteered for service and served as surgeon-lieutenant on board H.M.S. *Colossus*. After the war he took his degree of M.D. at Edinburgh, with commendation, and settled in practice in Elgin in succession to the late Dr. Dickson. He was a man of many and varied interests and public spirit: a keen antiquarian, he was recently elected a Fellow of the Society of Antiquarians; an authority and frequent lecturer on Jacobite history; an enthusiastic Freemason and Rotarian; a good golfer and president of the Moray Golf Club. To the British Medical Association he gave almost continuous service throughout his professional life, first as member of the executive, vice-chairman and chairman of the Kendal Division, and latterly as secretary of the Banff, Moray, and Nairn Division and member of the Scottish Committee and of the Insurance Acts' Subcommittee. All his work was marked with zeal, thoroughness, and patience. A cultured and courteous man, a loyal friend, and untiring worker for the common good, his loss at so early an age is much to be deplored. He is survived by a widow and one daughter.

Dr. JAMES MUNCE, who died on January 20th after a brief illness, had been in practice at Lisburn, in county Antrim, for many years, and was held in high esteem by his colleagues in that district. He received his medical education at Queen's College, Belfast, and in 1886 obtained the diplomas L.R.C.P., L.R.C.S.Ed., and L.R.F.P.S.Glas. Soon after qualifying he left Saintfield, county Down, for Lisburn, on his appointment as dispensary medical officer for the Drumbeg district. In Lisburn he became associated with the Antrim County Infirmary, and acted as anaesthetist for twenty-five years. Dr. J. W. Peatt sends the following appreciation: It is with a deep sense of loss that those who knew him have heard of the death of Dr. James Munce. In Lisburn he was looked upon by all classes as a trusty friend, an able practitioner, and a Christian gentleman. His quiet confidence gave assurance and comfort to all, and in moments of sorrow and trouble many instinctively turned to him. Of an unselfish character, he gave his services freely to the poor, without thought of recompense. His passing has caused great regret, equally among his colleagues and the members of the general public.

Dr. JOHN FOLLETT BULLAR, who died from drowning on January 24th, aged 74 years, was born at Bassett, near Southampton, and was educated at the University of Cambridge and at St. Bartholomew's Hospital Medical School. He graduated B.A.Camb. in 1877, and M.A. and M.B. in 1883; in the following year he obtained the diploma of F.R.C.S.Eng. After serving as ophthalmic house-surgeon and assistant demonstrator of anatomy at St. Bartholomew's Hospital he went to practise at Southampton. There he founded the Southampton Free Eye Hospital, to which he became surgeon and afterwards consulting surgeon, and he was also consulting surgeon to the Royal Hants County Hospital, Winchester. He removed to Guernsey some years ago and became very popular on the island. During the war Dr. Bullar served as an ophthalmic specialist with the rank of captain R.A.M.C. He and Mrs. Bullar were returning to Guernsey from a holiday in the South of France, and use was being made of a seaplane to make the journey from Corsica to the mainland when the machine turned turtle in the harbour at Antibes, and both were drowned.

The following well-known foreign medical men have recently died: Dr. EDMUND LASKOWSKY, formerly professor of anatomy at Warsaw, and inventor of a fluid for the preservation of anatomical specimens, aged 87; Professor PAUL KUBINYI, director of the first gynaecological clinic at Budapest, aged 58; and Dr. PIETRO DE AMICIS, an eminent paediatrist of Genoa.

The Services.

HONORARY SURGEON TO THE KING.

SURGEON VICE-ADMIRAL ARTHUR GASKELL, C.B., O.B.E., Medical Director-General of the Navy, has been appointed an Honorary Surgeon to the King.

DEATHS IN THE SERVICES.

Lieut.-Colonel Stafford Mary Adye-Curran, R.A.M.C.(ret.), died at Omagh on December 28th, aged 48. He was born on July 11th, 1880, was educated at the Catholic University, Dublin, and took the L.A.H. in 1900, also subsequently, in 1907, the D.P.H. of the Royal College of Surgeons in Ireland. After qualifying, he went out to South Africa as a civil surgeon, and, after nearly a year's service in that capacity, joined the R.A.M.C. as lieutenant on July 26th, 1901. He attained the rank of lieutenant-colonel on December 26th, 1923, and retired on March 24th, 1926, when he joined the Reserve of Officers. He served in the South African war, taking part in operations in the Transvaal, and received the Queen's medal with five clasps.

Medical News.

THE German Balneological Society (Balneologische Gesellschaft), at its jubilee congress held in Berlin last week, elected Dr. R. Fortescue Fox an honorary member. This honour was conferred in recognition of Dr. Fox's work as chairman of the International Society of Medical Hydrology, and as a personal tribute and expression of the esteem in which he is held by medical hydrologists in Germany.

THE Fellowship of Medicine and Post-Graduate Medical Association announces that on Monday, February 4th, at 5 p.m., Sir Henry Simson will give a lecture on "Some obstetric pitfalls," at the Medical Society, 11, Chandos Street, Cavendish Square, W.1, and on the same day, at 2 p.m., Mr. Mortimer Woolf will give a demonstration in general surgery at the Queen Mary's Hospital, Stratford. A demonstration on "Rheumatism and the cardiac child" will be given at the Royal Waterloo Hospital, at 2 p.m., on Tuesday, February 5th, by Dr. Gerald Slot. On Wednesday, February 6th, Mr. Mortimer Woolf will give a demonstration on "Tumours of the thyroid gland and their treatment," at the Wellcome Museum of Medical Science, 33, Gordon Street, W.C.1, at 4 p.m. Special courses will be given, from February 11th to 22nd, at the Chelsea Hospital, in gynaecology; from February 11th to March 9th, at the St. John's Hospital, in dermatology (pathology demonstrations will also be arranged); from February 25th to March 9th, at the Hospital for Sick Children, in diseases of children; and from February 25th to March 2nd, at the Brompton Hospital, in diseases of the chest. Copies of all syllabuses and information regarding the general course of the Fellowship may be obtained from the secretary, 1, Wimpole Street, W.1.

THE Royal Sanitary Institute has arranged a course of training for army officers and professional men in meat and food inspection and canteen supplies commencing on Monday, February 18th, and another beginning on Friday, February 22nd, for meat and food inspectors. Syllabuses of the lectures and examinations are obtainable from the secretary of the Institute, 90, Buckingham Palace Road, London, S.W.1.

THE Swiney prize for 1929 has been awarded by the adjudicators, the Royal Society of Arts and the Royal College of Physicians, to Dr. Sydney Smith, Regius Professor of Forensic Medicine in the University of Edinburgh, for his work "Forensic Medicine." Dr. Swiney, who died in 1844, left a sum of money to the Royal Society of Arts to provide a prize every fifth year for the best published work on jurisprudence. The prize, which consists of £100 and a silver cup of the same value, was offered this year on the 85th anniversary of the testator's death for a work on medical jurisprudence.

ON the occasion of the recent celebration of the centenary of the foundation of Cairo University and the Congress for Tropical Medicine a tour was made last December by sixty-seven medical practitioners from Germany, Austria, Danzig, Holland, and Poland to Egypt and Palestine, under the direction of Dr. F. Barach of Vienna.

THE Rizzoli Orthopaedic Institute in Bologna announces that a prize of 3,500 lire is offered for research in orthopaedics by medical practitioners in Italy and elsewhere. Further information may be obtained from the president of the Rizzoli Institute.

THE British College of Nurses, which was founded in 1926 with an endowment of £100,000, has issued a circular explaining its objects and indicating the advantages to trained registered nurses of membership. Its purpose is to raise the status of the nursing profession by organizing special courses of instruction and by the institution, in the future, of examinations—of a higher standard than that for State registration—for admission to its membership and fellowship. Meanwhile, it offers the benefit of facilities for education, scholarships, legal defence, pensions, and insurance; and of the use of the reference library and club rooms at its headquarters at 39, Portland Place, London, W.1, whence further information may be obtained.

AT a meeting of the Joint Tuberculosis Council on January 19th Dr. McDougall presented a report on behalf of the Employment Committee; in the discussion which followed Dr. Varrier-Jones emphasized the importance in colony work of attention to the patient's mentality, and of providing opportunities for any who showed exceptional ability to rise to the position of supervisers and teachers. The committee was asked to report on after-care schemes generally, including employment schemes and the employment of ex-patients in residential institutions. Dr. Brand reported that during 1928 14 had attended Sir Henry Gauvain's post-graduate course at Alton, 18 had been present at Dr. Varrier-Jones course, and 30 at the one arranged by Dr. Gloyne at Victoria Park Hospital. During 1929 he proposed to arrange courses in surgical tuberculosis, a course in artificial pneumothorax therapy and the interpretation of radiograms, and a French course at the University of Paris during Easter. After the meeting the council was entertained to lunch at the Hotel Russell by Sir Henry Gauvain.

THE *British Journal of Anaesthesia* announces the award of the £50 prize for the best inhalation research effort made by a citizen of the British Empire in 1928, to Florence Stephen, M.B., Ch.B., M.Sc., of the Manchester Royal Infirmary Research Department. The prize is in memory of the late Dr. S. R. Wilson of Manchester.

THE International Society of Medical Hydrology recently published a report on certain African waters. The information laid before the council proved of so much interest that the officers of the society took advantage of the visit to England of the eminent South African chemist, Professor M. Rindl of Grey University College, Bloemfontein, to hear from him some account of the chemistry of these waters. A small meeting of hydrologists and chemists was accordingly held on January 24th, the High Commissioners for South Africa and New Zealand sending representatives. Professor Rindl stated that he had been drawn to the subject in the search for home supplies of potash, and though his survey of the springs had failed to provide any results in that direction, he had made and published a preliminary survey in the hope of arousing medical and other interest in this important national asset. He found that the analyses of the waters were often incomplete and out of date, that insufficient clinical data were forthcoming, and that bathing facilities were inadequate. Many of the springs had a long history of use, first by the aborigines and then by the farmer-settlers, some still being used only in the most primitive way. Yet the waters themselves were well worthy of study and development. They were principally either sulphurous or chalybeate, no important brine springs being known, in spite of the extent of the surface "salt-pans." Seven of the springs had temperatures exceeding 105° F., the hottest being 158° F. Many were said to be radio-active, and one had a fair proportion of helium.

DR. PERCY COLEMAN, who for 30 years has been connected with the Clacton and District Hospital, has been presented with his portrait in oils by Harold Knight, A.R.A., an album containing the names of the 335 subscribers, and a wallet containing the residue of the fund. The presentation was made at a very largely attended meeting at the Grand Hotel, Clacton, presided over by Brigadier-General K. J. Kincaid-Smith, D.S.O., and attended by the medical practitioners and well-known personalities of the town.

THE following members of the medical profession were called to the Bar on January 28th: Drs. F. W. Kemp and G. Irving (Middle Temple), Dr. P. S. Selwyn-Clarke, *M.C.* (Gray's Inn).

THE advance programme of the twenty-second Voyage d'Études Médicales in the French Alps has been issued, and an outline of the programme may be useful to those whose circumstances necessitate the determination of their holiday arrangements early in the year. This year's tour will take place in the first fortnight of September, and will be organized by Dr. Piery, professor of hydrotherapeutics and climatology in the Faculty of Medicine at Lyons, who will share the scientific direction with Professor Paul Carnot and Professor Maurice Villaret. After visiting the Faculty at Lyons the party will assemble at Vals; from Briançon the members will travel by Alpine autocars through the Briançon district, the Dauphiné, and Savoy, visiting various health resorts and spas en route, to Evian, where the tour will terminate. The complete programme, with details regarding conditions of membership, etc., will be available about Easter. Inquiries should be addressed to Madame Juppé-Blaise, Federation of the Health Resorts of France, 1, Gordon Square, London, W.C.1.

PROFESSOR CLEMENS PIRQUET, director of the University Children's Clinic at Vienna, has been awarded the Aronson prize for his work on hypersensitiveness.

The following appointments have recently been made in the Italian faculties of medicine: Dr. A. Contino of Bari, professor of clinical ophthalmology at Messina; Dr. M. Bolaffio of Cagliari, professor of obstetrics and gynaecology at Modena; Dr. L. Torraca of Sassari, professor of surgical pathology at Padua; Dr. F. Ravenna of Turin, professor of morbid anatomy and histology at Perugia; and Dr. F. Spirito, director of the obstetrical school at Novara, professor of obstetrics and gynaecology at Siena.

DR. J. BORDET has been elected president of the Royal Academy of Medicine of Belgium for 1929, with Dr. M. Herman of Mons and Dr. J. Demoor of Brussels as vice-presidents.

Letters, Notes, and Answers.

All communications in regard to editorial business should be addressed to ***The EDITOR, British Medical Journal, British Medical Association House, Tavistock Square, W.C.1.***

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The ***TELEPHONE NUMBERS*** of the British Medical Association and the *British Medical Journal* are *MUSEUM 9861, 9862, 9863,* and *9864* (internal exchange, four lines).

The ***TELEGRAPHIC ADDRESSES*** are:
EDITOR of the *British Medical Journal, Aitiology Westcent, London.*
FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*
MEDICAL SECRETARY, *Mediscera Westcent, London.*

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone 24361 Edinburgh).

QUERIES AND ANSWERS.

HOLIDAY INTERCHANGE FOR DOCTOR'S DAUGHTER.

A FRENCH doctor's daughter, aged 18, and living at St. Palais-sur-mer, Charente Maritime, desires to spend her holidays in England, and would like to effect an exchange with an English doctor's daughter who wishes to visit France. Applications should be addressed to Miss Hilda Fox, International Society of Medical Hydrology, 139, Marylebone Road, W.1.

TREATMENT OF RHEUMATIC HEART DISEASE.

"X. Y. Z." would be glad to have suggestions as to treatment of a boy, aged 14, who has been in bed for ten months with cardiac rheumatism. His present condition is good, and there are no rheumatic pains; the pulse is regular and the rate is 100. The heart is hypertrophied and there is a loud mitral systolic murmur. The patient has been kept in bed on account of a persistent temperature of 98.4° to 99.4° F.; there is reason to believe the infection arises from an unhealthy throat. Is tonsillectomy or vaccine treatment to be recommended?

INCOME TAX.

Untaxed Income: Personal Allowances.

"M. E." has retired from practice, having a private income of about £500 per annum. Tax is deducted at the source, except in respect of £20 War Loan interest and as regards the annual value of his freehold house £32. Should he make any "return" of his income.

*** On the facts "M. E." can claim repayment as follows—

On £135−(£20+£32=) £52; that is, £83 at 4s. =	£16 12 0
And on £225 at 2s. ... ... =	£22 10 0
	£39 2 0

for 1928–29 and previous years. We suggest that he should take an early opportunity of calling at the office of the local inspector of taxes to explain the facts and obtain the necessary repayment claim forms. Seeing that he owes no tax—in fact, the reverse is the case—we do not see how there can be any "bother" caused by his not having made a return of his untaxed income.

Expense of Rent, Rates, etc.

"R. H. P." inquires as to the proportion allowable as professional expenses; he was allowed two-thirds until recently, when the proportion was reduced to one-half. The total amount of rent and rates is £107, and covers consulting and waiting rooms on the ground floor and partial use of other rooms.

*** We cannot advise an appeal against the allowance of one-half of the £107. That leaves £53 10s. to cover the rent and rates on the private portion of the premises, which does not seem unreasonable. The amount of "R. H. P.'s" non-professional income is not relevant.

LETTERS, NOTES, ETC.

BIOCHEMICAL CHANGES IN ALLERGIC PATIENTS.

DR. J. ANDERSON (Glasgow) writes: With reference to the interesting paper by H. W. Barber and G. H. Oriel on biochemical investigations in allergic conditions on November 17th (p. 880), the following notes of the biochemical changes in an asthmatic woman, aged 28, observed over a prolonged period, may be of interest. In this case twenty-four-hour specimens of urine were examined at frequent intervals. Attacks of asthma occurred generally at the week-end, and were preceded by constipation; she suffered also at menstrual periods. She had premonitory symptoms before the attack commenced, and evidence of an impending attack was shown by a higher specific gravity of the urine, a deposit of urates, a fall in *p*H, and the appearance of indican, with a trace of acetone. In the urine the specific gravity and acidity varied with the severity of the patient's symptoms, corresponding variations occurring throughout the investigation. The *p*H was lowest and the specific gravity highest at the onset of an acute attack. Preceding the attack the *p*H fell and the specific gravity rose; succeeding the attack the *p*H rose and the specific gravity fell. Albumin appeared, coinciding with a fall in diastase and associated with a higher specific gravity, a fall in *p*H, and increased acetone. When indican disappeared this was associated with a rise in diastase, and its reappearance was associated with a fall in the diastase content. A decrease of indican occurred with a second rise of diastase. The gradual improvement of the patient was associated with a fall of the specific gravity, a change in the deposit, and the disappearance of acetone. These results indicate that metabolic changes are present not only during the actual asthmatic attack, as shown by H. W. Barber and G. H. Oriel, but also for several days or weeks before the onset of the attack. This view has long been held by Dr. James Adam of Glasgow, and the investigation was made as an attempt to substantiate it.

HERNIA AND EVENTRATION OF THE DIAPHRAGM.

MR. A. P. BERTWISTLE (London, W.) writes: In your issue of December 1st, 1928 (p. 985), Dr. J. L. Thomas described an excellent case of diaphragmatic hernia, but under the title is the word evisceration; surely evisceration means disembowelling, a routine procedure in abdominal surgery before we learnt to have respect for the peritoneum. The term meant is eventration, and yet this, too, is wrong. Eventration is said to exist when the diaphragm has an unduly high dome; it may be congenital or due to trauma. The feature which differentiates it from hernia is that the diaphragm moves normally with respiration. Hernia has the same origin as eventration; it occurs almost always at the site of the embryonic pleuro-peritoneal passage and on the left side, pushing the heart over to the right. Its chief characteristic is that while the diaphragm moves downwards in inspiration, the stomach moves upwards, as shown radiographically by its air bubble. Carman aptly terms it "paradoxical respiration." See *Surgical Radiology*, by A. P. Bertwistle (p. 121).

SACRO-ILIAC MANIPULATIONS.

DR. EDGAR CYRIAX (London, W.) writes: In your report of the discussion of sacro-iliac pain by the Medical Society of London (December 22nd, 1928, p. 1137) one speaker is said to have expressed the opinion that complete anaesthesia of the patient is necessary before performing manipulation of the sacro-iliac joint. I have not found general anaesthesia essential in the vast majority of cases. The necessary relaxation can be obtained by preliminary vibrations and certain special passive movements which I have elaborated. I have reduced over 1,500 cases of subluxation of the ilium without the use of general anaesthesia, and at the most have merely caused the most transient and mild sensations—never any real pain. When an iliac subluxation is reduced in children the patients very frequently take no notice whatever of the bone having been moved.

KALA-AZAR IN CHINA.

DR. UPENDRANATH BRAHMACHARI (Calcutta) writes, with reference to a review of his book, *A Treatise on Kala-azar*, which appeared in the *British Medical Journal* of September 29th, 1928 (p. 572), to point out that he gave a full account of the work on this disease in China in the addendum, and that the reviewer's statement that "little is said of the disease in China" therefore requires amendment.

THE HIPPOCRATIC OATH.

WE have received from Mr. John Bensley Thornhill (77, Bedford Gardens, W.8) a blackwood panel, with bevelled edges, on which extracts from the Hippocratic oath, rendered into appropriate English, have been incised in white lettering. The panel rests on a small blackwood stand, and may conveniently be placed on the doctor's table. The price of the panel is 12s. 6d., and of the stand 1s. 6d.

HISTORY OF MANCHESTER.

WE have received from Dr. E. M. Brockbank the following note concerning his interesting article on the history of Manchester published in our issue of January 26th at page 167. "I find in my account of the history of Manchester in the current number of the *Journal* that I have, by an unaccountable slip, put cotton towns into West Cheshire, whereas they are in a curious easterly cur-tailed invasion of S.W. Yorkshire by Cheshire."

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 48, 49, 50, 51, 54, 55, and 56 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 52 and 53.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *31*.

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(Lorand, "Life Shortening Habits and Rejuvenation," 1922.)

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